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THE UNIVERSITY OF ALBERTA

A COMPARISON OF SELECTED PLAY COMPONENTS OF HEARING IMPAIRED AND HEARING CHILDREN

BY

© SUSAN CUTHBERT

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF EDUCATION

DEPARTMENT OF EDUCATIONAL PSYCHOLOGY

EDMONTON, ALBERTA

FALL, 1986

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled

A Comparison of Selected Play Components of Hearing-Impaired and Hearing Children

submitted by Susan Cuthbert

in partial fulfilment of the requirements for the degree of Master of Education

in Educational Psychology

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Date: September 5, 1986

ABSTRACT

The main purpose of this research was to compare cooperation, aggression, and wandering behaviour of hearing and hearing-impaired elementary school children in a free play setting. The subjects for the study were twelve grade one hearing children (mean age 6 years 11 months) and twelve grade one hearing-impaired children (mean age 7 years 2 months). The children were filmed on five consecutive days in a free play setting in their own schools. The films were analyzed and data collected from them. The results of this research clearly indicated that there were no significant differences in the amount of cooperation, aggression, and wandering behaviour displayed by hearing and hearing-impaired children in a free play setting. The results also indicated that hearing-impaired children changed activities more frequently than did hearing children. It also became evident that perceived aggression in hearing impaired children may be influenced by the force of the aggression and not by the number of occurrences of it.

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The author dedicates this thesis to her parents, Thomas and Muriel Davis, who bravely ventured to Canada so that their children might prosper.

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CHAPTER I

INTRODUCTION

Social interaction is considered to be a critical component of a child's behavioural development, with cognitive development being closely tied to the emergence of social behaviours. Maximizing the social skills of the hearing-impaired has been emphasized by their teachers for generations. The identification of those social behaviours that are lacking or unrefined in hearing-impaired children is a desirable step toward closing the gap between what is presently happening and what professionals working with hearing-impaired children would like it to be.

One way of identifying the social behaviours of hearing-impaired children is by looking at their play behaviour. Analyzing play behaviour has the advantage of showing how a child performs in a natural setting. It affords the viewer a chance of looking at the social skills of a child dealing with real life situations as opposed to being observed in a contrived clinical setting.

Analysis of children's play behaviour has been a valuable assessment tool for many years. Prominent researchers such as Parten (1932) and Gump and Sutton-Smith (1955) have helped pave the way in providing play norms that we still refer to today. Unfortunately, however, play research with

hearing-impaired youngsters has been scarce due in part to the lack of trained observers in play assessment and also to the immense amount of time that play research involves. Furthermore, any reference made to the play of this group has been based on results from paper and pencil tests of personality and social development which have then been generalized to play behaviour (Levine,1956; Myklebust,1960; Meadow,1980). The major criticism of this method of evaluation is that paper and pencil tests assume that a child has an appropriate level of language development. Hearing-impaired children often do not, and therefore this is an inappropriate method of measuring play behaviour. As a result there is a notable absence of empirical data on the play of hearing-impaired children.

Parten (1932) concluded that as children progressed through the years of 2 to 5 they spent less time in onlooker and unoccupied behaviour and became more involved with their peers by working together on common activities and by cooperating during play. Parten's work suggested that cooperative play behaviour increased through the elementary school years before tapering off in adolescence. Although isolate play was regarded as an important stage in a child's development if it persisted through the elementary years it could become a problem. The hearing-impaired child is especially prone to isolate play due to the

debilitating effects of a communication barrier posed by a hearing loss (Litoff and Feldman, 1981).

Similarly the presence of aggressive behaviour during play enables the child to experience the conflicts of his environment and learn how to solve problems on his own using whatever skills he may possess. Yet when anti-social or aggressive behaviour interferes with a child's ability to cope effectively with the social demands of his environment by alienating those around him, it sets the child apart from the interaction of others. The damage from being cut off from one's peers is magnified for a hearing impaired child due to the already existing condition of loss of hearing.

The present investigation was inspired by my experience with hearing-impaired youngsters in a play setting. Although many judgements had been made about the maturity and quality of the children's play behaviour by those in the field of deaf education (Moran,1977; Levine,1956; Myklebust,1960; Meadow,1980; Vernon,1969; Dicarlo and Dolphin,1972) there was little empirical evidence to support the notion that their play was 'inferior' to that of hearing children. Restaino's(1972) premise that hearing-impaired children had greater rigidity of behaviour, for example, was assumed to be as a result of limited experience with the environment due to a communication deficit. This

premise, however, was never supported by empirical research. I was also curious to determine if my own evaluation of their play behaviour was biased due to my close contact with them. In addition, play studies of hearing-impaired children had tended to focus on the behaviour of preschool children to the exclusion of elementary school aged children.

In summarizing, it appeared that there was an absence of empirical data about the play of hearing-impaired children especially at the elementary school level. Furthermore, generalizations made about the play of the hearing-impaired were made from the results of pencil and paper tests and were considered to be an inappropriate measure of play behaviour. In view of this it was felt that an investigation was needed of hearing-impaired elementary school children in an actual play setting to provide empirical data in the study of hearing impairment.

CHAPTER II

REVIEW OF LITERATURE

In order to effectively analyze the play behaviour of hearing-impaired children a comprehensive review of the literature pertaining to play was necessary. While an understanding of hearing-impaired children was foremost to this study, other background information on the theories of play behaviour and play patterns and norms of hearing children was also deemed to be essential. What play is, how it is evaluated, and what expectations we have of children during play were necessary components in this analysis.

In this chapter I evaluate the literature on the play of hearing-impaired children in an attempt to identify weaknessess and/or omissions that may have been important in this study. At the same time various theories of play behaviour are examined to clarify how they affect the way in which play is observed and evaluated. Finally, a survey of play patterns of hearing children is undertaken to provide guidelines for the study and norms by which the results can be compared.

Play Patterns of Hearing-Impaired Children

Play contributes to all types of learning, including social, cognitive, physical and emotional learning.Through play the child learns the cooperative nature of social existence and develops interpersonal skills. Although all children, including the handicapped, engage in play, it has been suggested that the play behaviour of hearing-impaired children is inferior to that of hearing children (Moran,1977; Vernon,1969; Vance,1968). While these assumptions were based on studies of preschool children very little research had been geared toward elementary school aged hearing-impaired children.

Although some researchers (Levine,1956; Myklebust,1960; Meadow,1980; Vernon,1969; Dicarlo and Dolphin,1972) have argued that the hearing-impaired child is socially and emotionally immature, impulsive, and egocentric, an analysis of their findings revealed that these conclusions were based on the results of pencil and paper tests of personality and social maturity. Surprisingly, actual observational studies of the hearing-impaired child engaged in play have not been carried out.

The Vineland Social Maturity Scale (Doll,1965), which has been used in a majority of the foregoing studies, indicated that hearing-impaired children scored lower in maturity than their hearing

counterparts of comparable age. However, Greenberg (1980) pointed out that because the Vineland Social Maturity Scale cannot be administered until the child is old enough to have some language, it may be that there is a relative decline in social competence of hearing-impaired children as they get older and language becomes more complex. He argued that the Vineland Social Maturity Scale confounded social behaviour with linguistic skill. This argument is also made by educators of the hearing-impaired.

Moran(1977) has suggested that both the mobility and the spatial relationships of preschool hearing-impaired children might be very poorly developed. In addition, she believed these children may exhibit fears, anxieties, or inhibitions about moving freely in space. Although these findings were not supported by actual play observations, other researchers have echoed these notions. Cohen(1980) has argued that, because of communication problems, confusion and perplexity occurred; the child limited his activities to those known to be safe and acceptable to his parents and, according to Mindel and Vernon(1976), this lead to restrictions in social and emotional growth. While this argument is possible, it is doubted whether a communication deficiency only will limit a child's play activities to such an extent.

Restaino(1972) also remarked that because of the deaf child's limited experiences with elements in the environment, greater rigidity of behaviour was present than with other children. Naiman,Schein, and Stewart (1973) also contended that hearing-impaired children frequently had a deprived and too restricted environment, which resulted in limited outside input and fewer opportunities for interaction. Unfortunately, however, the early experiences of hearing-impaired children have rarely been researched for evidence of a "restricted environment". Moreover, with the increased communication that sign language purportedly permits, it has been argued (Vernon,1969; Meadow,1980; Moores,1978) that hearing-impaired children are increasingly attaining substantial outside input. In the past several years evidence has accumulated to indicate that the use of manual communication at a very early age can have positive effects on personality development, social skills, and the ability to communicate needs and wants without arousing aggression in other children (Moores,1978).

Moran(1977) also stated that hearing-impaired preschool children wandered frequently while playing. Because of this wandering the child appeared to be lost in the situation and unknowledgeable about how to play. The end result of this behaviour was said to be the experience of frustration in the form of a temper

tantrum (Mindel and Vernon,1976). Denmark(1968), commenting on the display of such feelings, suggested it was the result of the hearing-impaired child's inability to express dissatisfaction or anger through verbalization. Denmark's(1968) study however, did not compare hearing-impaired with hearing children to determine if similar behaviours were present in both groups.

Lesser and Easser(1972) have suggested impulsiveness in hearing-impaired children is closely connected with lack of adequate communication skills for expressing needs and feelings. Litoff and Feldman(1981) also felt that, because hearing-impaired children were unable to use language to channel impulses, they resorted to socially unacceptable behaviour. In effect they met their basic emotional needs in antisocial or maladaptive ways. Since the effects of impulsiveness and communication skill has yet to be more fully researched it is still inconclusive that antisocial behaviour is a product of poor communication ability. There appears to be a belief by professionals in deaf education however, that this is the case and it is a belief that is hard to discard.

Although no research on play was offered in support, Moran(1977) stated that compared to the play of normal children the hearing-impaired child's play

contained quicker motions and was more active motorically. Motor performance was also argued to be significantly lower that that of normal children (Vance,1968). Once again, Moran(1977) failed to provide the research to back up these statements. Despite the paucity of research, these atatements are also ones voiced by educators of the hearing-impaired.

Collectively hearing-impaired preschool children were said to be less cohesive and to make fewer successful social contacts in their play than did normal children (Moran,1977). They were also said to attempt and respond less to interaction with other peers, vocalize less, and to be less self-directed and more attentive to self (Moran,1977).

Social skills that enable children to get along with others were said to be developed through language (Meadow,1972). The result of ineffective communication can be reflected in the child's social relationships. Heider's(1948) study of observed pairs of preschool hearing and hearing-impaired children reflected this. She found the hearing children were more able than the deaf children to gain control of a social situation without arousing either aggression or withdrawal in other children. She also found the social relationships of hearing-impaired children to be more diffuse, less structured, and less sharply oriented than the social relationships of the hearing children. It is

unfortunate that this study has not been replicated or other studies done to support these thirty-eight year old results. Similar studies today may not support these findings due to the possible influence of sign language on social skills.

A study by Herren and Colin(1972) illustrated the greater difficulty hearing-impaired children had in progressing from competition to cooperation when confronted with a task requiring cooperation. The cooperative/competitive nature of hearing-impaired children's play was another weakly documented area, this being the only study to discuss this aspect. Despite the lack of information on cooperative behaviour the literature has emphasized the difficulty that hearing-impaired children had with it.

Research (Meadow,1980) indicated that the deaf population is not homogeneous. Over one third of hearing-impaired children in schools in the United States have been identified as having an additional behavioural or emotional disability. Other researchers (Freeman, Malkin and Hastings,1975; Schleisinger and Meadow,1972) have supported this incidence of emotional disturbance, although their figures were inconsistent with each other. Despite findings of behavioural problems ranging from 2.4 percent to 22.6 percent, there was a consensus that behavioural/social disturbances were much more frequent in

hearing-impaired school populations (Rutter, Tizard and Whitmore,1970; Myklebust and Buchard,1945).

Vernon(1969) maintained that many of the major causes of hearing impairment were also major causes of brain damage and behavioural problems. He suggested that the behavioural problems found among hearing-impaired children were not due to their hearing loss, but to the etiology of the impairment itself. He argued that if trauma to the brain was sufficient to cause deafness or hearing loss then other mental problems may also be present. Therefore deviant behaviour may reflect mental impairment in addition to hearing impairment. According to Moran(1977) the play patterns of hearing-impaired and mentally retarded children had numerous similarities. She inferred that lack of cooperation, undesirable behaviour in group situations, and immature play patterns were among such similarities.

Federlein(1981) observed that research into the play activities of special education groups had used primarily one category of handicap, mental impairment. She also confirmed that few known studies had observed the play characteristics of a specialized group of children such as the hearing-impaired especially at the elementary school level.

Among the studies that Federlein(1981) mentioned with mentally impaired populations, there was evidence

of low levels of play interaction between preschoolers. Play interaction and socialization were reported to increase with the decline in retardation of the subject. In another study, Harlick(1978) observed play interactions in a mainstreamed preschool classroom where the handicapped peers were classified into various special education categories. The results of that research showed isolated play, exhibited by both handicapped and non-handicapped peers, to be the most frequent type of play. The results also indicated that there was no difference between handicapped and non handicapped peers.

Whereas the foregoing presented play from the deviancy model of social /emotional development, it has been possible to look at hearing-impaired children from a similarity model of development, which Moores (1978) claimed was a more positive model of human nature.

Restaino's(1972) work with Cooperative Research Endeavors in the Education of the Deaf(CREED) generated a set of hypotheses. One of the hypotheses was that hearing-impaired children moved through the stages of development in the same sequence as hearing children. Schleisinger and Meadow(1972) also analyzed the development of hearing-impaired children using Erik Erikson's(1963) eight stages of man. Although they believed the deaf child was unable to successfully cope

with the second stage - autonomy versus shame and guilt, they confirmed Restaino's hypotheses.

Furth(1973) claimed that, if the hearing-impaired child had lived in a normal and adequate environment, evidence of symbolic play, the most typical of childhood play, would be present. Again, speaking of preschoolers he said that, although bereft of a linguistic system, the deaf child at age five was as yet hardly handicapped in social development. From then on, he said, the complex thinking that accompanies the knowledge of language resulted in the deaf child lagging behind his hearing peers in socialization. Agreeably some hearing-impaired children will not have benefited from early language experiences to the same extent as their hearing peers and evidence of this should appear in hearing-impaired children's play in the elementary school. Children learn social skills through play and communication is a necessary tool for socializing. If a hearing-impaired child has a language deficiency then play will be affected for the very nature of socialization depends on the ability to communicate.

Furth(1973) believed teachers in schools for the deaf tended to exaggerate the severity of the behavioural problems of their pupils and that the purportedly high prevalence rates reflected the opinions of the adults rather than the characteristics

of the children. Children's behavioural disorders were more likely to be defined in terms of social relationships, said Meadow(1980), thus the perception of the deviant child almost always occurred in the context of adult expectations for acceptable patterns of behaviour.

Cohen(1980) claimed that an inherent complication in the interpretation of reported incidence studies was related to the person making the judgement. In the case of teachers' evaluations she felt consideration must be given to the subjective judgements that may be given by a body of professionals who worked closely with those they were evaluating. It was also argued (Moores,1978) that behaviour which might be considered maladaptive in one situation might be healthy and realistic in another.

Diagnosis of a hearing-impaired child often does not occur until age four (Furth, 1973). This tended to suggest that there was little abnormal play behaviour in the preschool years to alert the parents that a hearing problem may be present. Greenberg(1980), using the Alpern-Boll Developmental Profile (Alpern and Boll,1972) gauged maternal estimates of their child's developmental level for the five areas of functioning: physical skills, self-help, social, academic, and communication. The results showed the hearing-impaired children as achieving at or close to age level in all

areas except communication. Since these five areas of functioning were commonly found in children's play these results would appear to be inconsistent with the hypotheses that hearing-impaired children's play differs from that of hearing children's play at the preschool level. These differences, however, may appear at the elementary school age.

Many tests of personality and behaviour are administered through tests in which the subject is required to check off a response on an accompanying answer sheet. These pencil and paper tests are considered to be formal testing procedures. Although formal testing had been the predominant method of evaluating the personality characteristics of hearing-impaired children the results were said to be imprecise, inconsistent, and frequently inappropriate (Moores,1978). The obvious shortcoming when using this method was the language level and extensive verbal exchange required. Pencil and paper testing was considered to be a method that conflicted with the predominant behavioural tendency of young children to continue doing whatever it was they were doing (Gotts,1969).

In addition, Cohen(1980) questioned the validity and objectivity of formal tests of personality and social maturity that were standardized on normal populations. A question that arose from this was, "Do

the results from these pencil and paper tests generalize to play settings?" It was felt that the results did not generalize to play settings because a naturalistic research design was necessary to evaluate actual play behaviour.

Perhaps one of the most unfortunate problems related to the interpretation of research findings was the lack of a definition or a common frame of reference for the behaviour being identified (Cohen,1980). The interpretation of what was acceptable or unacceptable, significant or insignificant was often left open to the subjective interpretation of a large variety of professionals who had had varying degrees of contact with hearing- impaired children (Cohen,1980).

Levine(1974) noted that one of the major difficulties in assessing hearing-impaired children was the lack of trained professionals. Observing play necessitated a professional who was skilled in the observation of children and who was familiar with developmental norms. This would account for the meager attempt which had been made to evaluate the play of hearing-impaired school aged subjects in a naturalistic setting to date.

In summarizing, it would appear that not all that has been hypothesized about the play of hearing-impaired children is empirically founded. Whereas research (Moran,1977; Levine,1956; Myklebust,1960;

Meadow,1980; Vernon,1969) had suggested the hearing-impaired child to be socially and emotionally immature, impulsive, and egocentric, these findings were not in direct reference to play behaviours and referred to preschool children only. Furthermore, there was no empirical data to support Moran's(1977) suggestions that the mobility and spatial relationships of hearing-impaired children were poorly utlized while engaged in play. In addition, Restaino's (1972) assumption that the hearing-impaired had a restricted and deprived environment did not stand up in view of the lack of any supporting research.

Empirical research (Vance,1968) showed that motor performance was significantly lower for hearing-impaired preschool children as compared to hearing children. In addition, preschool hearing-impaired children were shown to have greater difficulty with cooperative tasks (Herren and Colin,1972). Although the foregoing can be used as a guideline, little of it was in direct reference to elementary school aged children of which studies of this nature were shown to be scarce.

Theories of Play Behaviour

Over the years there have been a host of explanations to try to account for play behaviour. The

problem of defining and categorizing play was one which continuously plagued researchers. While researchers often agreed on an activity being playful or not, they were not always able to say why. In addition, the literature (Levy,1978; Sutton - Smith,1966) showed that there were many different kinds of play which also made categorization troublesome. The problem of defining and categorizing play has resulted in the development of a number of theories of play behaviour. Each explanation of play behaviour has been a reflection of the prevalent thinking of that day. The most popular theories of play behaviour are classical theories, psychoanalytical theories, ecological theories, sociological theories, and developmental theories. In addition, within each of these larger theories are numerous variations of the theory.

The word 'play' was derived from the Anglo-Saxon term, 'Plega', meaning to take a risk, to guarantee, to risk or to devote oneself to a single purpose (Staniford,1978). Play was natural, spontaneous, and often repetitious. Early attempts to define play have tended to define it according to one of three types: (1) play as defined by motive; (2) play as defined by context; (3) play as defined by its attributes other than context or motive (Staniford,1978).

In a comprehensive review by Rubin, Fein, and Vandenberg(1983), it was claimed that there was no one

definition of play, as such. Rather, there were various overlapping criteria as follows:

(1) Play was intrinsically motivated.

(2) Play was characterised by attention to means rather than ends.

(3) Play was distinguished from exploratory behaviour. The latter was guided by "what is this object and what can it do?" while play was guided by "what can I do with this object?"

(4) Play was characterised by nonliterality or pretense.

(5) Play was free from externally applied rules (in contrast to games).

(6) The participant was actively engaged in play (in contrast to day-dreaming or idling).

The more of these criteria that were present, they claimed, the more certain it was that it was play that was being observed.

Classical theories of play basically revolved around five explanations of play behaviour. The cartharsis explanation described play as a way of removing oneself from reality; the compensation theory of play looked at play as a way of making up for anxiety; the surplus energy theory of play suggested play as steming from energy not needed for survival; the relaxation theory of play believed play was a

period of respite from work; and the task generalization theory of play suggested that the learning of skills in play would be used in real life situations. These explanations formed the basis for today's accepted "psychology" of leisure behaviour (Levy, 1978). Classical theories of play were mainly concerned with the determinants and consequences of play as opposed to the characteristics of play.

The psychoanalytic theories of play developed out of the scientific explanation of man put forth by Sigmund Freud. More recently these theories have been extended by Erik Erikson(1963) who emphasized the interactive role of the human social environment with the biological makeup of the individual. These theories of play were mainly concerned with the determinants of play as explained in terms of anxiety and conflict resolution in the various life stages as proposed by Erikson(1963).

Socialization theories of play were an outcrop of the social learning theory. According to these theories play was motivated by gratification of primary and secondary needs in the individual.

The developmental theory of play was based on Piaget's(1952, 1962) model of cognitive development. Piaget wrote that cognitive development was a product of the interactions between heredity and the environment. The growth of intelligence, he postulated,

was accomplished through interaction with the environment via two complementary processes: assimilation and accomodation. During assimilation the individual shaped the external environment to fit its currently existing cognitive level, whereas during accomodation the organism tried to alter his own cognitive structures so it could negotiate the novel demands of the situation(Levy,1978). Through continual assimilation and accomodation adaptation and learning occurred.

Play behaviour described in terms of the person and his environment was considered to be the ecological aspect of play behaviour. The ecological theory dealt with the structure and conditions of play behaviour. Findings from ecological play studies primarily revealed that play behaviour of the same children differed from setting to setting.

Despite the usefulness of many of the foregoing theories, the ecological aspect of play was considered important in my study due in part to the recent recognition by social scientists that play behaviour was by and large governed by the interaction of a person and his environment. In effect the situation and the surroundings of a particular situation had a behaviour-influencing power. A particular setting would exclude some potential behaviours, necessitate other behaviours, and encourage or discourage still other

behaviours. To generate the three components of play this particular study would be looking at, an environment was needed that would allow those components to appear. In addition, the three behaviours of this investigation had been successfully studied previously by other researchers using an ecological approach (Gump and Sutton-Smith, 1955; Parten,1932). These previous studies would help provide normative studies of types of play and the amounts of cooperative, aggressive, and wandering behaviours that had been found in the play of hearing children so that a comparative study could be made with hearing-impaired children.

Play Patterns of Hearing Children

Certain trends that had been noted in the play behaviour of hearing children were developmental, perhaps even universal in nature; others were culture dependent (Eiferman,1971). Research of play in hearing children by far outnumbered studies done with hearing-impaired children.

A critique of the study of play in hearing children showed that large scale observations for testing hypotheses had been scarce (Eiferman, 1971). Those observations that had been conducted were either made on a small selected, unrepresentative population or on very limited samples of children. Also, many of

the normative studies of children's play dated back to the 1890's and might not be applicable to today's youngsters.

Parten(1932), employing the observational sampling technique that is a trademark of ecological research, studied the social participation of preschoolers. She developed six categories of social participation (un-occupied, solitary, onlooker, parallel, associative, and cooperative) with which to evaluate children's play. These categories have been used extensively in later studies and are considered to be a popular method of observing play (Smith, Takhvar, and Gore,1985).The most noted findings to come out of Parten's research were:

(1) The most frequent play group among preschoolers consisted of two children.

(2) Group size increased with the age of the play group.

(3) House and dolls generated the most cooperative play, whereas clay and beads elicited the most parallel form of play.

(4) Sand play was most often chosen by two to two - and - one-half-year-olds while house and dolls was the most chosen by three year olds.

(5) By assigning a social participation quotient to each transaction of play behaviour, she was able to determine that play house

elicited the most complex social responses, whereas train play elicited the least complex social responses.

(Parten's (1932) categories of play were assigned a score directly related to the amount of social participation inherent within the category: (1)unoccupied, -3; (2)solitary, -2; (3)onlooker, -1; (4)parallel,+ 1; (5)associative,+ 2; (6)cooperative, +3).

As a result of this study Parten(1932) concluded that as children progressed in age from 2 to 5 they spent less time in solitary and onlooker behaviour and more time involved with their peers working on common activities and cooperative play. In Parten's(1932) early work it was also concluded that youngsters 2 to 4 years of age spent approximately 39 percent of their free play time playing with other children.

Generally the data suggested that children 3 and 4 years of age spend approximately 35 to 40 percent of their free play time engaged in an activity with another child. At the kindergarten age this figure rose to approximately 42 percent. This study assumed that the trend of increased time spent in cooperative behaviour continued through the first year of elementary school.

Gump and Sutton-Smith's(1955) study of physical setting and social interaction used six major categories: (1)sharing; (2)helping; (3)asserting; (4)blocking; (5)demanding; and (6)attacking. Their study revealed that different settings elicited different kinds and amounts of social interaction in children and that settings could be prescribed to elicit certain behaviours. The idea of prescribing a setting was useful in the design of this study.

In depth studies of playground use by children on housing estates in England (Hole, 1966) revealed some interesting data on how children used playground equipment and spaces and how much time was spent at each. Although the researchers had a pre-conceived notion that the play would be quick moving and noisy the observations dispelled these ideas. Figures (Hole, 1966) showed that the most frequent activity was sitting, standing or lying down. When watching and talking were added to these figures over one third of total activity time was of the passive type. This study also showed there was no marked difference in the general pattern of activities of boys and girls.

Wandering was another category distinguished by the observers in Hole's(1966) study. Over thirty-five percent of all children observed, showed wandering behaviours. This included children who were searching for a friend as well as those aimlessly wandering on

the outskirts of a group. Another interesting finding was that only eighteen percent of all children participated in imaginative or other types of games. These findings disagreed with popular beliefs that children were usually very active during play. The results of this research made me consider that perhaps the play of hearing-impaired children may be more similar to that of hearing children than had previously been thought.

Subsequent research (Hulme and Lunzer,1966) of children's free play patterns on play equipment discovered that there was no significant difference in the way normal and mentally handicapped children used play equipment. Similar studies (Linford, Jeanrenaud, Karlsson, Witt, and Linford, 1970) however, disputed Hulme and Lunzer's(1966) findings. The 1970 study showed that, in fact, normal children tended to move more often and more rapidly between equipment and spend a longer time on equipment than mentally handicapped children. There was also shown to be a difference in the preference of each group for the various pieces of equipment. Linford et al.(1970) suggested that low or non-verbal children may have a tendency to use free space more so that they can watch other children and imitate them. This being the case a free play area was deemed mandatory in the play setting for this study.

The study of children's play is a complex undertaking. The ecological theory of play behaviour was one method of approaching this phenomenon. Available research of ecological play behaviour indicated that there may be a difference between normal and handicapped children's play behaviours .

Cooperative Play - Normative Studies

Cooperative play involves the reciprocal interaction of two or more children in an activity which necessitates mutual participation. The individual child subordinates his interests to that of the group. All the members engage in a similar activity with no division of labour and no organization of the group (modifed form Parten, 1932, p.251).

In Parten's(1932) early work it was concluded that preschoolers interacted socially 39 percent of the time. Of this figure approximately 16 percent was spent in cooperative play. Parten's(1932) work did not include school aged children, however.

Barnes(1971) in an attempt to replicate the findings generated by Parten(1932) concluded that 3 and 4 year olds interacted socially 25 percent of the time during free play with approximately 7 percent being of a cooperative nature.

Rubin's(1976) investigation of the relationship between social participation and role taking determined

that children with a mean age of 3.7 years spent approximately 38 percent of their free play time engaged in social play. Of this amount 10 percent was deemed to be of a cooperative nature.

In a further study by Rubin and Associates (Rubin, Watson, and Jambor,1978) it was determined that children with a mean age of 3.9 years engaged in social participation 39 percent of the time. in this case the amount of cooperative play was estimated at approximately 9 percent.

Despite the variance in figures the data suggested that 3 and 4 year old youngsters spent approximately 7 to 16 percent of their free play time engaged in cooperative play. In a paper investigating the comparative free play behaviours of preschool and kindergarten children (Rubin et al.,1978) it was revealed that kindergarten children displayed significantly more social interactive play than did preschool children. Kindergarten children interacted socially 42 percent of the time as compared to 33 percent for preschool children. These figures supported the contention that children became more socially active with maturation and that this phenomenon was evident in their play. This phenomenon of increased social activity and cooperation was assumed to continue through the first year of elementary school.

Aggressive Play - Normative Studies

Conflicts over space and equipment periodically arise when youngsters spend time with peers. These conflicts more often than not result in aggressive or negative social interaction.

Conceptually aggression has been defined as any act whose intent was to injure, physically or psychologically, another person (Herron and Sutton-Smith,1971).

The literature on aggression (Barrett,1979; Hay and Ross,1982; Herron and Sutton-Smith,1971) stressed the consistency of empirical findings that males were more aggressive than females throughout the childhood years. It also suggested that the amount of aggression was dependent on the setting.

Barrett's(1979) study of aggression for boys and girls across four settings disclosed that free outdoor activity with limited supervision produced the highest rate of aggression. Barrett's investigation also noted that levels of aggression did not significantly lower when a supervisor was present during the activity.

Wandering Behaviour - Normative Studies

Wandering behaviour involves a period of inactivity for the child. The child may aimlessly glance around the room or else he is within earshot of a group but prefers to watch the other children play.

Hole's(1966) study of playground use by children on housing estates in England showed that approximately 33 percent of activity time was of the passive type. That study also discovered that over 35 percent of all children observed showed wandering behaviours. These figures were said to refute popular beliefs about the play of hearing children.

In Parten's(1932) study of youngsters 2 to 4 years of age it was concluded that approximatley 12 percent of free play time was spent engaged in onlooker or unoccupied behaviours. This figure was expected to decline for elementary school aged children who have been reported to engage in less wandering behaviour with maturation.

Barne's(1971) study of Parten's(1932) play norms revealed that 24 percent of children's free play time was spent in onlooker or unoccupied behaviour whereas Parten had found only 12 percent. From this he concluded that children's play activities had changed substantially.

A further study by Rubin(1976) indicated that children engaged in a combination of onlooker and unoccupied activities for approximately 16 percent of the time. Contrary to Barne's(1971) findings these results closely approximated those found in Parten's (1932) original study of social participation.

Whereas a further study by Rubin, Maioni, and Hornung,1976) indicated strong social class differences in many of the play behaviours of preschoolers no significant differences were found to exist for the unoccupied and onlooker categories. Rubin et al.,(1976) determined that middle class and lower class children participated in onlooker and unoccupied behaviours 17 and 15 percent of the time respectively.

The data has suggested that 3, 4, and 5 year old youngsters engaged in onlooker/unoccupied behaviours for approximately 12 to 24 percent of their time. My study assumed that as a result of maturation unoccupied or wandering behaviour would decline for elementary school aged children.

Summary

My review of the literature brought to light certain aspects of the play of hearing-impaired and hearing children.

The literature on play in hearing-impaired children was generally found to be outdated, lacking in supporting empirical data, and based on generalizations from pencil and paper tests of social development. In addition, many reports of play behaviour were from adult observations of which many were thought to be over exaggerated and tainted by those working so

closely with the group being observed. Furthermore, a majority of studies focused on preschool children and there was a notable gap in studies of hearing-impaired school aged children. Of the play characteristics mentioned in the literature cooperation, aggression, and wandering were thought to be the least documented and most weakly supported of the lot. These three characteristics were felt to be in need of further research.

The review of theories of play behaviour revealed there to be many different kinds of play which made evaluating play troublesome. The best method of evaluating play for this study was determined to be one put forth by Parten(1932) based on the ecological aspect of play. This method was said to have been used extensively by other researchers in establishing play norms.

The results generated by the review of play in hearing children generally showed that normal children did not play as expected. Results from play studies disagreed with pre-conceived notions and in some instances the play of handicapped and non-handicapped peers was said to be much the same. Play norms of hearing children showed disagreement among researchers and findings that were not replicated.

Purpose of the Study

The purpose of the proposed study was to contribute to the body of knowledge about the play patterns of hearing-impaired school aged children. Specifically, my study was intended to update the literature on hearing-impaired children's play patterns and provide supporting empirical data on the play behaviours of this group based on actual play observations as opposed to pencil and paper tests.

In addition, I attempted to fill a gap in the knowledge on the cooperative, aggressive, and wandering behaviours of hearing-impaired school aged children which I thought to be lacking in the literature.

In undertaking this study, I also attempted to evaluate the various methods of assessing play behaviour and provide information on the best method for use with hearing-impaired children.

At the same time as providing information on the play patterns of hearing-impaired children I attempted to show how the literature on play in hearing children was inconclusive and contradictory. By doing this I tried to show how results from previous comparative studies of hearing and hearing-impaired children's play differed depending on the study being used in the comparison. The inadequacy of using this method in comparing two groups of children's play was also attempted to be shown.

Questions

The review of the literature suggested a number of characteristics in the play of hearing-impaired children that were deemed to be inadequate or inferior to that of hearing children. While some of the behaviours described were observed during actual observational studies others were not. Those characteristics that were described as common in hearing-impaired children yet in which empirical research was lacking were determined to be important to this study. Specifically, those were cooperation, aggression, and wandering behaviour. Based on these three characteristics or components of play the study was designed to answer the following questions.

Question 1: "Do hearing-impaired children display the same amount of cooperation as hearing children?"

Cooperative behaviour becomes increasingly evident in children's play as they grow older and more mature. As a result of pencil and paper tests of personality the hearing-impaired child was found to have an immature personality development and was therefore considered to be unable to cooperate with his peers to the same extent as his hearing counterparts. The argument against using this approach in evaluating a child's play was that this method was considered inappropriate since a naturalisitic approach would have

been more reliable. Many of the cooperative studies cited had been performed on hearing-impaired preschoolers many of whom were underdeveloped in language. As children reached school age however, language was thought to be more developed and with it the necessary social skills for cooperation. It was felt that as a result of the foregoing, cooperative scores for hearing-impaired youngsters could have parity with scores for hearing children if a better measurement tool was used such as that found in play studies in naturalistic settings.

Question 2: "Do hearing-impaired children display the same amount of aggressive behaviour as hearing children?"

Litoff and Feldman(1981) argued that because hearing-impaired children were unable to use language to channel impulses they resorted to socially unacceptable or aggressive behaviour. The feeling that hearing-impaired children were more aggressive and physical with each other was often voiced by those who worked closely with them. This judgement of aggressive behaviour has often been the result of subjective reports and little empirical evidence is available on the subject. The literature suggested that the amount of aggression was dependent on the setting. It was felt

that in a similar setting hearing and hearing-impaired youngsters would not show differences in aggression.

Question 3: "Do hearing-impaired children display the same amount of wandering as hearing children?"

It has been argued (Moran,1977) that hearing-impaired children wandered more often than did hearing children when they were playing. The literature on play in hearing children however, revealed that hearing children wandered more than was previously expected (Hole,1966). In addition, the amount of wandering reported by the various studies varied and there was no consensus. Comparative studies of wandering behaviour in handicapped and non-handicapped peers were unable to agree if differences were present. In light of this it appeared that there were contradictions in the literature regarding the wandering behaviour of handicapped and non-handicapped peers and that differences in the amount of wandering may be non-existent.

CHAPTER III

METHOD AND PROCEDURES

Research Sample

A total of twenty-four children participated in the investigation. Twelve of the children were hearing-impaired and twelve were hearing; each group was composed of six boys and six girls.

The hearing-impaired children for the study consisted of twelve 6 and 7 year olds in attendance at the Alberta School for the Deaf in Edmonton, Alberta. The children ranged in age from 6 years 2 months to 7 years 11 months with a mean of 7 years 2 months. The children were considered to be profoundly hearing-impaired with an average loss greater than 75 decibels in both ears. The etiology of hearing loss for each child varied; four children had suffered hearing loss due to hereditary factors, another four had suffered postnatal illness that was sufficient to destroy hearing, two had endured pre-natal developmental complications and two others were from unknown causes.

The hearing-impaired children consisted of all available subjects less those with physical handicaps who were available at the Alberta School for the Deaf. Letters, which were required to be signed before

Table 1

Characteristics of Participants

Hearing Participants

Subject	Gender	Date of Birth	Age
1	F	12/15/79	6 yrs. 3 mths.
2	F	4/18/78	7 yrs. 11 mths.
3	F	9/18/78	7 yrs. 6 mths.
4	F	9/12/79	6 yrs. 6 mths.
5	F	7/21/79	6 yrs. 8 mths.
6	F	11/27/79	6 yrs. 4 mths.
7	M	8/29/78	7 yrs. 7 mths.
8	M	9/08/78	7 yrs. 6 mths.
9	M	1/05/80	6 yrs. 2 mths.
10	M	8/18/79	6 yrs. 7 mths.
11	M	6/30/79	6 yrs. 9 mths.
12	M	10/02/78	7 yrs. 5 mths.

mean age of participants 6 yrs. 11 mths

Hearing-Impaired Participants

1	M	7/31/78	7 yrs. 8 mths.
2	M	1/19/80	6 yrs. 2 mths.
3	F	4/07/79	6 yrs. 11 mths.
4	M	4/13/78	7 yrs. 11 mths.
5	M	10/09/78	7 yrs. 5 mths.
6	F	8/12/79	6 yrs. 7 mths.
7	F	4/20/79	6 yrs. 11 mths.
8	M	11/29/78	7 yrs. 4 mths.
9	M	6/03/78	7 yrs. 9 mths.
10	F	9/11/78	7 yrs. 6 mths.
11	F	9/06/79	6 yrs. 6 mths.
12	F	12/14/78	7 yrs. 3 mths.

mean age of participants 7 yrs. 2 mths.

filming started, were sent out to inform parents about the study. Parents had the option of not granting permission for their child to partake in the study. All available students received parental consent to participate in the study.

The hearing children for the study were twelve six and seven year olds in attendance at Garneau Elementary School in Edmonton, Alberta. The children ranged in age from 6 years 2 months to 7 years 11 months with a mean of 6 years 11 month. Thirty-five letters were sent to the parents of the hearing children who qualified for the study. Of the initial thirty-five letters eighteen were returned permitting participation in the study. The children were then randomly selected to compose a group of six boys and six girls.

The children displayed no physical abnormalities, were ambulatory, and possessed varying degrees of language competence.

Pilot Study

Prior to the commencement of the actual study various observing techniques of children in their free play activities were attempted. From these observations I was able to determine the strengths and weaknesses of each technique and choose a method of observation that was suitable.

One method attempted was actual filming of the children on the playground during free play at recess and lunch time. Children were found to disappear from sight, move too far from the camera to be seen clearly, act it up for the camera, and move too quickly to be kept track of on such a large area.

An observational check sheet technique was also attempted with the investigator present on the playground. This method brought two major problems to light. First, the interference of the children with the observer, and second the inability of the observer to 'go back' and look again at the behaviour.

Although it appeared that filming was the most suitable method, it was somewhat problematic in a playground setting; therefore a controlled environment appeared to be required. In addition, filming would allow for more precise and accurate recording of data because the footage could be stopped to clarify an observation.

Design

The design of the study was comparative in nature. The play of both hearing-impaired and hearing children was investigated. Although one common playroom would have been more desirable, transportation problems made

this unfeasible; therefore the children were filmed in separate playrooms in their own schools.

The hearing-impaired children participated in the study for five 35-minute sessions from March 3 to March 7, 1986. Each day at 11:00 a.m. the children were escorted to the playroom by me. The hearing sample also participated for five 35-minute sessions from March 10 to March 14, 1986. At 12:00 noon the children were brought to the playroom where they played until 12:40.

For the first two days of observation I taped the sessions, practised working the camera equipment, and generally attempted to iron out unexpected occurrences. During this time the children were free to ask questions regarding the camera equipment and get used to its presence. The children were then left to play freely for 35 minutes without interference or instruction from me. During the play sessions however, the camera and I were visible to the children.

During the play sessions I was called upon by the children to put an end to disputes and discipline children who had hurt others or who were felt to be interfering with the play of others. As a result I intervened on two occasions with the hearing group and on one occasion with the hearing-impaired group. When intervening I made a conscious effort not to discipline aggressive behaviour or to stop the occurrence of it so as not to influence the children's behaviour.

Play Setting

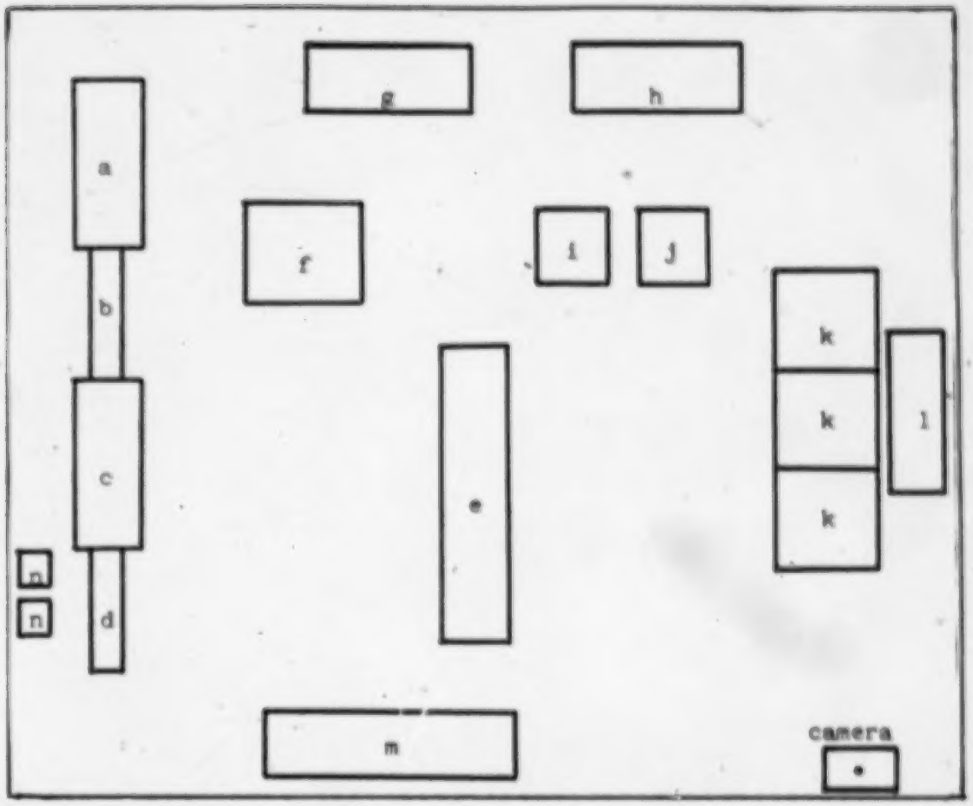
In both schools, the playroom setting consisted of a large room permitting the free execution of gross motor activities. Numerous pieces of large and small equipment were available to the children at all times (see Figure 1). Although the equipment in the playroom at each location was set up identically prior to each session, the children were free to move the equipment around during the session providing it did not pose a danger. Only once during a hearing-impaired session did I have to enter the playroom and dismantle a potentially hazardous arrangement by the children.

Collection of Data

Each of the sessions of play for each group was filmed. There was one 35-minute recording for each of the sessions for a total of 105 minutes of film for each group of children. The films were used to collect the play data. Although two other observers and myself were used to collect data from the films, only my data were used in the statistical analyses. The two other observers' observations were used to establish interobserver agreement. It was believed that collecting and analyzing data from one observer would add to the consistency of the results.

Figure 1

Play Setting



List of Play Equipment

a - climbing rungs

b - 1 m padded platform

c - climbing rungs

d - 1 m long slide

e - 3 m vinyl tunnel

f - wooden rocker

g - 1 m high climbing trestle

h - 1.5 m high climbing trestle

i/j - 1 m cube

k - 4" x 4" tumbling mats

l - 2 m long bench

m - wagon

n - 2 scooterboards

o - small equipment: 2 hoops, 5 balls, 3 skipping ropes, and 6 bean bags.

The first two films on each group were used for observer training, while the last three were used for the actual collection of data. Each 35-minute film clip was set up so that the last thirty minutes of it could be viewed by the observers. A point sampling method of observation was used focussing on one child at one time. With the aid of a timed tone indicating 10 and 15 second intervals, observations were made of one child's behaviour. At the start of the film a double tone sounded to indicate the start of the first observation session. Ten seconds later a single tone sounded to signify a checkmark be made for that observation session. Five seconds later a double tone sounded once more to indicate the start of the second observation session, and so on. At the end the film was rewound and the next child was observed in a similar manner at the same point in time on the film.

A total of 120 observations were made for each child for each play session for a total of 360 observations per child or 4,320 per group for the total three sessions. The observations were numbered from 1 to 4 to indicate the behaviour category observed: 1=cooperation; 2=aggression; 3=wandering; 4=other (see Appendix E).

Categories of Play

For the purpose of recording observation data for cooperation, aggression, and wandering behaviour it was necessary to have working definitions of these behaviours. A more complete description with examples has been included in Appendix A however, a general overview has been included here.

Cooperative behaviour was considered to be a behaviour in which the children reciprocally interacted with each other in an activity that necessitated mutual participation. During the activity the individual child subordinated his own interests to that of the group. Specifically, cooperative behaviour included assisting, taking turns, physical contact of affection, sharing, leading/following, and cooperative task coordination.

Aggressive behaviour or negative social interaction was deemed to be any behaviour that interfered with another child working on his own task. The initiated action had to be non-productive in that it did not assist either child in completing the task at hand. The criteria for negative social interaction were negative physical contact, threat of negative physical contact, restraining, and destroying/terminating activity. Verbal negative social interaction was not looked at in this study as it was believed that there were two different modes of

communication and that one definition would not have met the requirements of both groups of children.

Wandering behaviour was defined as being a period of inactivity for the child. The child was either engaged in solo-unoccupied behaviour in which he occupied himself by sitting around or by playing with his own body, or else he was engaged in solo-onlooker behaviour in which the specific purpose of sitting out of the activity was to watch the others play.

Finally, other behaviour was determined to be any behaviour that did not fit any of the preceding categories. Generally, these behaviours were solo-occupied, escaping threat of negative physical contact, unknown behaviour, and being unobservable at the time of observation. Also included in this category was being unobservable due to being out of range of the camera at the time of observation. This happened an average of 3 times in 120 observations.

Observer Training

The observers received two hours of training in the behavioural categories prior to the data coding. The categories were discussed and examples given. The practice film sessions were then used to help identify the children the observers were about to watch and additional time was spent practicing observing using the prescribed checksheet. The practice film sessions

were also used to establish interobserver agreement. When the criterion of 70 percent agreement (Kazdin,1977; Johnson and Bolstad, 1973) had been reached on the social interaction categories the training period ended and the actual collection of data began.

Reliability of Ratings

I and two other raters were used in testing interrater agreement. The first rater scored 10 minutes of each of the hearing children from the practice film clipping. This resulted in 40 observations per child for a total of 480 observations in all. Of these total observations we agreed 386 times and disagreed 94 times for an 80 percent agreement.

Whereas there was no problem in attaining a high level of agreement between the first rater and I, when observing the hearing children we did experience difficulty in achieving a similar level of agreement for the hearing-impaired children. The first rater appeared to be having difficulty following the hearing-impaired children as they seemed to move quickly between equipment and playmates. As a result of this a third observer was brought in who had more experience observing children.

Due to time constraints the third observer coded 10 minutes each of 4 hearing-impaired children and 10

minutes each of 2 hearing children chosen at random. Of the total 240 observations we agreed 200 times and disagreed 40 times for an 83 percent agreement.

Treatment of the Data

To answer the question of whether there was any difference in the amount of cooperation, aggression, or wandering behaviour of hearing and hearing-impaired children a two-way analysis of variance using group status and gender as the independent variables was used for each behaviour.

CHAPTER IV

RESULTS

Patterns of Cooperation

The mean cooperation, aggression, and wandering scores are summarized in Table 2. The results of the two-way analyses of variance for these behaviours are summarized in Table 3.

Mean cooperative scores for hearing and hearing-impaired children across three sessions were virtually identical with scores of 180.7 and 180.2 respectively. A two-way analysis of variance with hearing status and gender as the independent variables showed that the effects of gender were not significant $F(1,20) = 0.002$, $p>.20$, and that the effects of hearing status were also not significant $F(1,20) = 0.001$, $p>.20$, nor was there a significant interaction $F(1,20) = 0.467$, $p>.20$.

Patterns of Aggression

As can be seen from Table 2 aggressive behaviour was an infrequent occurrence for both groups. Although the hearing-impaired group had higher aggression scores over all sessions, the means did not prove to be significantly different $F(1,20) = 1.13$, $p>.20$. A two-way analysis of variance also showed there to be no significant difference between the genders $F(1,20) =$

Table 2

Means of Total Play Behaviour Scores as a Function of Hearing Status and Gender

	Hearing	Hearing-Impaired
Cooperation		
Boys	190.5	171.5
Girls	170.8	188.8
Total	180.7	180.2
Aggression		
Boys	13.0	12.7
Girls	5.0	16.7
Total	9.0	14.7
Wandering		
Boys	28.5	31.0
Girls	69.7	50.2
Total	49.1	40.1
Other		
Boys	128.0	144.8
Girls	114.5	104.3
Total	121.3	124.6

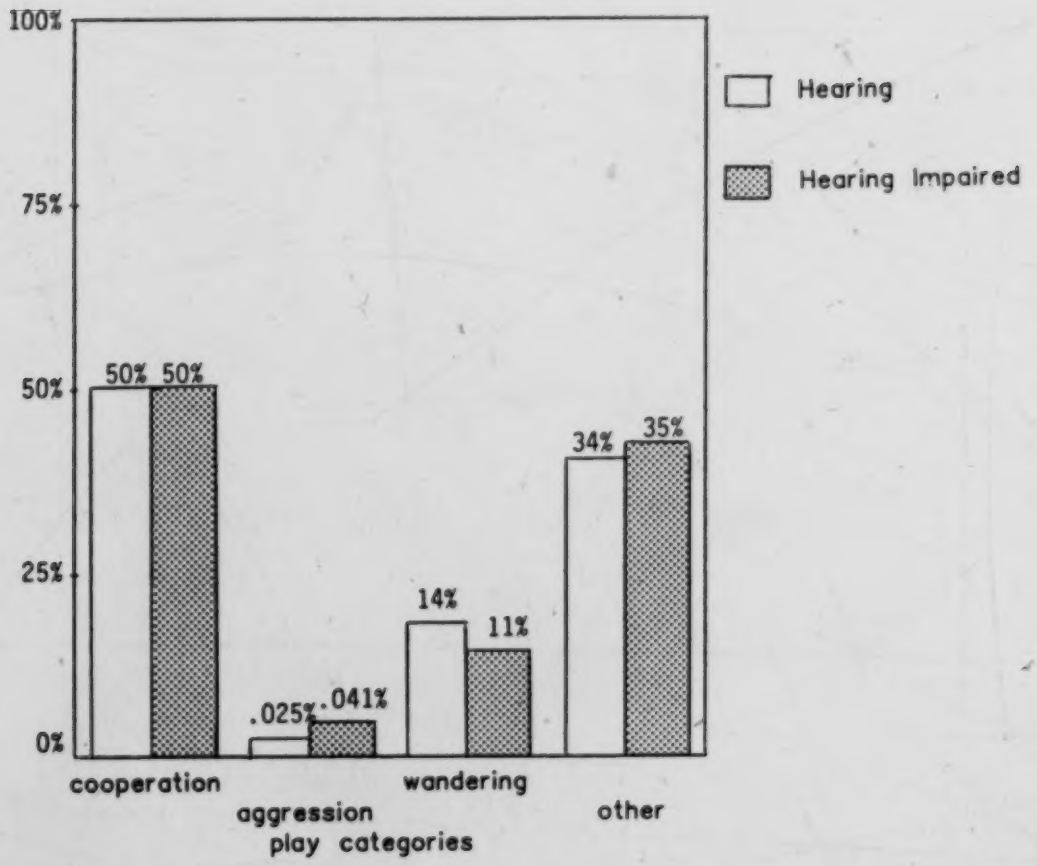
Table 3

Analysis of Variance Tables by Hearing Status and Gender

	sum of squares	df	mean square	F	signif of F
			Cooperation		
Group	1.5	1	1.5	0.00	0.985
Gender	8.1	1	8.1	0.00	0.966
Group X Gender	2053.5	1	2053.5	0.47	0.502
Within	87960.7	20	4398.0		
			Aggression		
Group	192.7	1	192.7	1.13	0.302
Gender	24.0	1	24.0	0.14	0.712
Group X Gender	216.0	1	216.0	1.26	0.275
Within	3426.7	20	171.3		
			Wandering		
Group	433.5	1	433.5	0.15	0.702
Gender	5460.2	1	5460.2	1.90	0.183
Group X Gender	726.0	1	726.0	0.25	0.621
Within	57407.7	20	2870.4		
			Other		
Group	66.7	1	66.7	0.03	0.865
Gender	4374.0	1	4374.0	1.96	0.177
Group X Gender	1093.5	1	1093.5	0.49	0.492
Within	44623.7	20	2231.2		

*p<.10
**p<.05

Figure 2
Proportion of Observations For Total Sessions



0.14, p>.20, nor was there a significant interaction $F(1,20) = 1.26$, p>.20 (see Table 3).

Patterns of Wandering

Although the hearing children showed more wandering behaviour a two-way analysis of variance showed that the effects of hearing status were not significant $F(1,20) = 0.15$, p>.20, and that the effects of gender were also not significant $F(1,20) = 1.90$, p>.18. There was also no significant interaction $F(1,20) = 0.25$, p>.20.

Behavioural Changes

Although the amount of time spent in each of the play categories was similar for the two groups (see Figure 2) it became apparent when trying to establish interobserver agreement that there was a difference in the number of times the children changed from one behaviour to another. The hearing-impaired children appeared to change from cooperation to wandering or isolate play very quickly which made coding the checksheets troublesome. This was an unexpected occurrence that prompted a closer inspection.

To determine whether this finding was significant a count was made of how many times each child changed from one behaviour category to another from the observation checksheets used in the actual study. It

Table 4

Analysis of Variance Tables of Behavioural Change Scores by Hearing Status and Gender

	sum of squares	df	mean square	F	signif of F
Group	9440.7	1	9440.7	23.69	0.001**
Gender	864.0	1	864.0	2.17	0.901
Group X Gender	816.7	1	816.7	2.05	0.901
Within	7968.7	20	398.4		

*p<.10
**p<.05

Table 5

Means and Standard Deviation of Behavioural Changes for All Subjects In Total Sessions

	Hearing		Hearing-Impaired	
	$\bar{X}$	SD	$\bar{X}$	SD
Boys				
Session 1	32.5	5.1	42.0	13.5
Session 2	32.3	5.9	34.7	12.4
Session 3	18.7	11.7	34.8	7.3**
Girls				
Session 1	33.7	9.7	46.3	6.6*
Session 2	23.3	7.2	49.7	13.2*
Session 3	26.8	9.2	39.2	13.6
Total				
Session 1	33.1	7.4	44.2	10.4**
Session 2	27.8	7.8	42.2	14.5**
Session 3	22.8	10.9	37.0	10.7**

*$p<.10$
**$p<.05$

was found that the hearing-impaired group scored consistently higher in behavioural changes over the three sessions for a total mean score of 41.1 as compared to 27.9 for the hearing group. A two-way analysis of variance showed that the effects of hearing status were quite significant $F(1,20) = 23.69$, $p<.01$, however the effects of gender were not significant $F(1,20) = 2.17$. There was also shown to be no significant interaction $F(1,20) = 2.05$ (see Table 4). These findings proved to be consistent for all sessions (see Table 5). Appendix D shows the behaviour change scores for the two groups of children.

Observations About The Quality of Play

In addition to the formal quantitative analysis that was undertaken of different play behaviours of the two groups of children, certain impressions were made upon me during coding about the quality of the children's play. These qualitative observations are mentioned here as they either refute the literature or else are noted as being worthy of further study.

Some behaviours had been deemed in the literature to be more mature and desirable than other play behaviours. For example, dramatic play was considered to be the most desirable mode of play for enhancing learning. It had been claimed in the literature that hearing-impaired children lagged behind their hearing

peers in play behaviour in that dramatic play was not in as much evidence as it should have been. During my study however, many instances of dramatic play were observed in the hearing-impaired children.

Hearing-impaired children were also claimed to spend a good deal of their time in solo play or wandering behaviour which has been looked upon as the least favourable of the play behaviours. This again, was refuted in my study as the hearing-impaired children engaged in equal amounts of wandering behaviour as the hearing children.

An interesting observation was the way in which smaller play groups within the larger group formed themselves. The hearing children played mostly in clusters of boys or girls but rarely mixed. The hearing-impaired children did not seem partial to who was in their play group and most groups were composed of both boys and girls. In addition, the hearing-impaired children changed play partners often while the hearing group seemed to stay with the same partner for a length of time.

CHAPTER V

DISCUSSION

Patterns of Cooperation

The results of the assessment of free play showed that there was no difference in the amount of cooperative play exhibited by both groups of children. Quantitatively both groups played the same. These results refuted the literature on cooperative play in hearing-impaired children. Whereas it had been remarked in the literature (Furth,1973) that hearing-impaired children would start to lag behind their peers in social behaviour once they entered school the results of my study did not support this in a play situation. The results indicated that either the literature was at fault or else the purported lag in socialization had not yet developed and would emerge at a later point in time.

Generally, my investigation indicated that at the grade one level hearing-impaired children displayed the same proportion of cooperative play as hearing children and that these proportions were within the norms as reported for normal children.

Although my study reported no difference in the quantity of cooperative play the quality of the play was not measured. By "quality" I am refering to the

degree or level of play that can be identified in a child's play behaviour. It may well be that the quality of cooperative play in hearing-impaired children is what prompts those working with them to suggest that their cooperative play is inferior or lacking. Merely sharing a common object, as was commonly seen during the coding of the data, may not satisfy the criteria of good cooperative play. Teachers may have in mind cooperative play involving organized games in which group delineation or roles is evident along with group discussion and agreement of these roles.

Patterns of Aggression

The results of my study also showed that at the grade one level hearing-impaired children displayed the same proportion of aggressive behaviour as hearing children and that these proportions were within the norms as reported in the literature for normal children. The mean proportions of aggressive behaviour for hearing and hearing-impaired children were .025 and .041, respectively.

Even though the mean aggressive scores for hearing-impaired girls was triple the mean score for hearing girls, due to the small number of subjects this did not prove to be statistically significant.

The fact that the hearing-impaired girls scored higher than the hearing girls in aggression suggests to me

that there may be a difference that needs to be more fully investigated using a larger population.

As with cooperative behaviour my investigation recorded the number of occurrences of aggressive behaviour and not the nature of it. Despite there being no significant difference between the aggressive scores of both groups of children there still remains the belief by those working with hearing-impaired children that they are more aggressive. The word "more" however, as in more often or "more" as in the amount of force of has not been clearly defined in previous studies so it is difficult to accurately determine what is actually meant by it. The observation that hearing-impaired children are more aggressive may therefore have been influenced by the force used by hearing-impaired children when they actually touched each other as opposed to the number of times they touched each other. I also believe that the way in which hearing-impaired children beckoned each other by jabbing the shoulder may be mistaken for aggression by naive observers.

Patterns of Wandering

The results of this assessment of play behaviour further revealed that hearing and hearing-impaired children wandered during play the same proportion of time and that these proportions fell within the range

of various studies as reported in the literature review.

A scan of aggregated wandering behaviour scores for both groups revealed that wandering behaviour was not restricted to a few children but was evident in all children. One hearing female scored unusually high on wandering behaviour as this seemed to be the only thing she did. Apart from this incident wandering behaviour was fairly evenly distibuted among the members of the groups.

Behavioural Changes

Whereas no differences were found in the amount of cooperative, aggressive, or wandering behaviour of the two groups of children a significant difference was found in the number of times hearing-impaired children changed from one behaviour to another compared to hearing children. Whereas this finding was an unplanned part of my study it proved to be a very interesting one to emerge.

The fact that hearing-impaired children changed behaviours often was supported by the literature (Moran,1977; Mindel and Vernon,1976). The lack of cohesiveness of the group due to ineffective communication skills may have been a cause of this. In addition, impulsivenss resulting in a child jumping from one activity to another at random was another

possible explanation as well as lack of concentration on the task at hand.

It is unknown whether the fact that hearing-impaired children changed behaviours more frequently was an advantageous or disadvantageous condition of their play. Whereas failing to attend to a play situation for a length of time suggested lack of concentration it also suggested the ability to seek a more challenging environment.

In addition, the behaviour changes recorded where those made when a child changed from one distinct category to another. Changes within a category were not measured. For example, a child who changed behaviour from cooperation on climbing apparatus to cooperation with bean bags did not change categories therefore was not considered to have changed behaviours.

The teaching method used with hearing-impaired children may have been a factor in their high behavioural change scores. In their first years of school hearing-impaired children are encouraged to investigate, analyze, touch, and use as many senses as possible in acquiring information. They are often seen in active paticipation in the classroom walking around engaged in a hands-on lesson. While this may be a good teaching method initially it may be hard for the students to discard this habit in the later grades and

CHAPTER VI

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The purpose of the study was to determine whether certain components of play in hearing-impaired children were similar to those in hearing children. The components investigated were cooperation, aggression, and wandering behaviour in a free play setting. As the study progressed it became apparent that hearing-impaired children changed behaviours more often than did hearing children. This then, became an additional finding.

A free play assessment of twelve hearing-impaired and twelve hearing children using an interval time sampling method of observation showed that the two groups of children spend approximately equal amounts of time engaged in each of the three components of play. Cooperative activities comprised 50 percent of their free play time, aggression .03 percent, wandering 13 percent, and other behaviours 35 percent. In addition, it was shown that the hearing-impaired children changed behaviours more frequently than did the hearing children and that these changes were statistically significant.

Establishing an acceptable level of observer agreement for both groups under investigation was

somewhat problematic. Inter-observer agreement was relatively easy to establish for the hearing group however it became more difficult to establish with the hearing-impaired group. It appeared that the more a child moved around and changed behaviours the more difficult it was to determine what exactly the child was doing.

Conclusions

The investigation of free play in hearing-impaired children gave support for the following conclusions.

1) There was no difference in the amount of time spent in cooperative play between hearing and hearing-impaired children. Both groups spent approximately 50 percent of their free play time in cooperative activities as defined by the behaviour categories.

2) There was no difference in the number of aggressive behaviours observed during the free play of hearing and hearing-impaired elementary school children.

3) There was no difference in the amount of wandering behaviour detected in both groups of children. Both groups showed wandering behaviour to be evenly

distibuted throughout its members.

4) There was a significant difference in the number of behavioural changes recorded for the groups. The hearing-impaired children changed behaviours consistently more often than did the hearing children and this finding was statistically significant.

Recommendations

The following recommendations are suggested for further research in the area of play in hearing-impaired children.

1) How do teachers and professionals working with hearing-impaired children differ in their judgement of the play behaviours of hearing and hearing-impaired children?

2) How does the play behaviour of mainstreamed hearing-impaired children differ from that of institutionalized hearing-impaired children?

3) How do aggressive behaviours in hearing-impaired children differ from those in hearing children?

4) How do hearing-impaired children differ

from hearing children in the way they use equipment during free play?

5) How do the size and makeup of playgroups of hearing-impaired children differ from those of hearing children?

6) How do hearing and hearing-impaired children organize themselves to solve a dispute or complete a task during free play?

7) The current literature on hearing-impaired children should update its findings based on available research of play behaviour and not on generalizations from pencil and paper tests.

8) The method of gathering free play data should be more fully investigated. Interval time sampling may not be the most appropriate way of observing play behaviours.

Delimitations and Limitations of the Study

There were delimitations and limitations in the design of the study which should be taken into consideration.

Delimitations

1) The study was delimited to a sample of children ranging in age from six to seven years.

2) The study was delimited in that analysis of the components of play was recorded on observational intervals from pre-recorded tapes.

3) The study was delimited in that the children were not observed in one and the same room but were in rooms set up in their own schools which were identical in design.

4) The study was delimited to a two week time period, March 3rd to March 14th, 1986.

5) The study was delimited to twelve hearing-impaired children taken from a total communication educational setting who use sign language as the predominant method of communication.

Limitations

1) The study was limited in that the results cannot be generalized to hearing-impaired mainstreamed children due to the influence of their hearing peers on their play behaviour.

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Appendix A

1) Behaviour categories.

BEHAVIOUR CATEGORIES

1. COOPERATION

A behaviour is considered to be cooperative if the children reciprocally interact with each other in an activity which necessitates mutual participation. The individual child subordinates his interests to that of the group.

1.1 Assisting. One child assists another in the execution of a task. (helping behaviour)

Examples

1) One child holds a scooter while another child gets on.
2) Upon request one child passes a hoop to another child.

1.2 Taking Turns. One child waits for another to complete their task before proceeding themselves.

Examples

1) Waiting for the slide to clear before going down.

1.3 Physical Contact of Affection. Two or more children engage in physical contact of an affectionate nature.

Examples

1) Linking arms.

2) Holding hands.

3) Placing arms around one another.

4) Embracing.

5) Kissing.

6) Patting another child on the back.

1.4 Sharing. Two or more children reciprocally offer and receive an object. Both children must simultaneously touch the material with one hand or pass the object between them by pushing, rolling, or throwing it. Sharing may include concurrently using a single piece of equipment in an activity requiring mutual participation. Sharing may also include performing a task for a common goal.

Examples

1) Giving up a scooter so another child can have a turn.

1.5 Leading/Following. Two or more children are involved in following one another on foot, or with pieces of equipment such as wagons or scooters. The leader of the chase must be compliant with the activity, expressing pleasure in having a pursuer by looking back to check progress by smiling. The follower in

turn must not be intent in catching the leader but in maintaining the leading/following activity.

1.6 Cooperative Task Coordination. Two or more children mutually interact for the purpose of making some material product, or striving to attain some goal that individually they could not achieve. The efforts of one child supplement the others, with a division of labour and roles occurring. There must be a definite task involved.

Examples

1) One child pulls another child around the room on a scooter using a skipping rope.
2) Three children sit down to "eat" at a table and chairs set up. Each is playing a role.
3) A child imitates another.
4) Two children push large boxes to make a "house".
5) One child carries another child.

2. NEGATIVE SOCIAL INTERACTION

Any behaviour that iterferes with another child working on his own task. The initiated action must be non-productive in that it does not assist either child in completing the task at hand.

2.1 Negative Physical Contact. Direct physical contact with another child in the form of hitting, biting, punching, pulling hair, kicking, etc. Indirect physical contact with another child through a piece of equipment for example, hitting someone with a bat, is also negative physical contact. Trying to cause harm to someone is the intention of the act.

2.2 Threat of Negative Physical Contact. Threat of direct or indirect negative physical contact with another child. For example, approaching a child with a raised hand. Chasing someone with intent to harm or provoking, taunting, or teasing someone.

2.3 Restraining. Interferring with a child's progress by holding him with the arms, sitting on him, or lying on him. Keeping equipment away from a child who is playing with it or moving it so as to interfere with the activity at hand is also considered to hinder progress. Tugging on equipment with someone in attempting to secure it is also restraining.

2.4 Destroying or Terminating Activity. Destroying the construction of another child or interferring so as the activity is terminated. Knocking down a tower of blocks

being worked on, or taking away bean bags that are being used in a target game are examples.

Examples

1) One child hits another with a fist.

2) One child takes a toy from another child.

3.WANDERING BEHAVIOUR

A period of inactivity for the child.

3.1 Solo-Unoccupied Behaviour. "The child is apparently not playing but occupies himself with watching anything that happens around the room that happens to be of momentary interest. When there is nothing exciting taking place he plays with his own body, just stands around, or sits in one spot glancing around the room." (Parten, 1932, p.249)

3.2 Solo-Onlooker. The child is physically inactive but spends most of his time watching the other children play. This type differs from unoccupied in that the onlooker is definetly sitting aside for the purpose of observing particular groups of children rather than anything that happens to be exciting. The child sits or stands within 10 feet of the group so that he can see and/or hear everything that takes place. This category

also includes one child in casual conversation with another. There must be no evidence of role play and no apparent activity results from the conversation.

Examples

1) A child carrying a hoop stops to watch two children fight over a scooter.
2) A child sits on a bench focussing his attention on playmates on the floor.

4.OTHER BEHAVIOUR

Any behaviour which does not fit into the preceeding categories. The child may be gainfully occupied but playing alone, moving to escape threat of harm or physical contact, being the recipient of physical contact or threat, unknown behaviour or unobservable. Also included in unobservable behaviour is being off the screen at the time of observation. (Adapted from Wasson,1980)

Appendix B

1) Equipment categories.

EQUIPMENT CATEGORIES

CLIMBING RUNGS:

- horizontal climbing bars with bars spaced 40 cm apart. Approximately 2 m in length

PADDED PLATFORM:

- 1 m long foam and vinyl padded piece of wood used as a walkway between the two climbing rungs

WOODEN SLIDE:

- 1 m long wooden slide with hooks to fit over the climbing rungs. Can be used as a platform or slide

VINYL TUNNEL:

- 3 m vinyl tunnel with a .75 m diameter reinforced with metal rings

WOODEN ROCKER:

- 1 m x 1.5 m seat on rockers with a middle platform for the feet

CLIMBING TRESTLES:

- 1 m high and 1.5 m high climbing bars

CUBES:

- 1 m wooden cubes having raised shapes on three sides and openings on the other 3 sides

TUMBLING MATS:

- (3) 1 m x 1 m padded foam mats with velcro on 3 sides and a centre fold

BENCH:

- 2 m long wooden bench with a back and arms

WAGON:

- 1 wooden wagon with metal pull handle

SCOOTERBOARDS:

- (2) 40 cm x 40 cm wooden boards on castors

SMALL EQUIPMENT:

- (2) plastic hoops with a 1 m diameter
- (5) balls - 3 x 10 cm diameter foam
  - 1 x 30 cm diameter beach ball
  - 1 x 30 cm diameter cosom ball
- (3) skipping ropes 2 m long with wooden grips
- (6) bean bags 15 cm x 15 cm

Appendix C

1) Parent letters.

February 14,86

Dear Parents,

My name is Susan Cuthbert. I am a teacher of Physical Education at the Alberta School for the Deaf and also a graduate student at the University of Alberta.

I am interested in looking at certain aspects of play in hearing impaired children. At the same time I would like to compare their play with that of hearing children the same age.

With your permission I would like to observe your child along with a group of his/her peers while they are playing. The children will be observed in a playroom at Garneau school during the lunch hour. Your child will not be identified in the study itself and all observations will be used strictly for the study.

Please contact me if you have any concerns.

Sincerely,

Susan Cuthbert
434-1481 (B)
463-5772 (H)

I hereby give my permission for_____ to participate in the play study.

I do not wish my child _____ to participate in the play study.

Signed:_____Date:_____

February 17,86

Dear Parents,

My name is Susan Cuthbert. I am the physical education teacher at Alberta School for the Deaf. I am also working on a thesis at the University of Alberta.

I am interested in looking at the play of hearing impaired students at Alberta School for the Deaf.

With your permission I would like to observe your child along with a group of his/her peers while they are playing.The children will be observed in a playroom at A.S.D. during the lunch hour. Your child will not be identified in the study and all observations will be used strictly for the study.

Please contact me if you have any concerns.

Sincerely,

Susan Cuthbert
434-1481 (B)
463-5772 (R)

I hereby give my permission for _____to participate in the play study.

I do not wish my child _____ to participate in the play study.

Signed:_____ Date:_____

Appendix D

1) Data for Subjects.

DATA ON SUBJECTS

Subject 01 Status Non-Hearing Impaired Female
D.O.B. 09/12/79 AGE: 6yrs 6mths

Session 1

1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	3
1	1	3	4	4	4	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	3	4	4	4	4	1	1	3
3	3	3	4	4	4	1	1	1	4	1	1
1	1	1	1	4	4	4	4	4	4	3	4
1	1	1	1	1	1	1	4	4	4	4	4
4	4	4	4	4	1	1	4	1	1	4	4
4	4	4	4	4	4	4	4	4	4	4	1

Session 2

1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	3	4	4	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
4	1	4	1	1	1	4	4	1	1	1	3
1	1	4	1	1	1	1	1	1	1	1	1

Session 3

4	4	1	1	4	4	1	1	1	1	1	4
4	4	1	1	1	1	1	1	1	1	1	1
1	1	1	1	4	4	1	1	3	4	1	1
1	1	1	1	4	4	1	1	1	1	1	1
1	1	1	1	4	1	1	1	1	1	1	1
1	1	3	3	4	4	4	1	1	3	4	4
4	1	1	1	4	3	3	4	4	1	3	4
4	4	4	4	1	1	1	1	1	1	1	1
1	1	1	1	1	1	4	4	1	1	1	1
3	4	4	4	4	4	4	4	4	4	4	4

1=cooperation 2=aggression 3=wandering 4=other

DATA ON SUBJECTS

Subject 01 Status Hearing Impaired Female
D.O.B. 12/14/78 AGE: 7yrs 3mths

Session 1	1	1	1	1	1	1	1	1	4	1	1	1
	1	1	1	1	4	1	1	1	1	1	1	1
	1	2	1	1	1	1	4	4	1	1	1	1
	1	4	1	2	3	1	2	3	1	1	1	2
	2	1	1	1	1	1	1	1	1	1	3	2
	1	1	1	1	1	1	1	3	1	1	1	1
	2	2	2	2	1	1	1	3	4	4	3	3
	3	3	2	2	2	4	1	1	1	2	1	1
	3	4	2	1	1	1	4	1	1	4	4	2
	1	1	1	1	1	1	1	1	1	1	1	1
Session 2	4	1	1	1	1	1	2	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	3
	4	4	4	2	1	1	4	1	3	1	1	1
	1	1	1	4	3	4	4	2	2	2	1	1
	1	2	2	1	4	2	4	2	2	4	4	3
	3	4	4	4	2	3	3	3	4	3	2	2
	4	2	4	1	2	2	2	1	4	1	3	1
	2	3	2	4	4	2	1	2	3	4	4	4
	3	4	4	4	3	4	1	1	1	1	1	1
	1	1	1	1	4	2	4	1	4	4	4	3
Session 3	1	4	4	1	1	1	1	4	4	4	4	4
	4	4	4	4	1	4	1	1	1	4	1	2
	1	4	4	4	1	1	2	4	4	4	4	2
	1	1	2	1	2	2	2	4	3	1	1	4
	1	1	4	1	2	4	4	4	4	1	1	4
	1	1	1	1	3	4	1	1	1	4	4	1
	4	1	1	4	1	1	1	1	4	4	3	1
	4	1	1	1	1	1	1	1	4	4	3	1
	4	1	1	1	4	1	1	1	4	1	4	4
	1	4	1	1	1	1	4	4	2	4	3	4

1=cooperation 2=aggression 3=wandering 4=other

DATA ON SUBJECTS

Subject 02 Status Non-Hearing Impaired Female
D.O.B 11/27/79 AGE: 6yrs 4mths

Session 1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	4	1	1	1	1
	1	1	1	1	1	4	4	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	3	4	4	4	4	1	1	3
	3	3	3	3	3	3	1	1	1	4	1	1
	1	1	1	1	4	4	4	3	4	4	3	4
	1	1	1	1	1	1	1	4	4	4	4	4
	4	4	4	4	4	1	1	4	1	4	1	1
	4	4	4	4	4	4	4	4	4	4	3	3
Session 2	1	1	1	1	1	1	1	1	1	3	3	1
	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	4	1	1	1
	1	1	1	3	3	1	1	1	1	1	1	1
	1	1	1	3	3	4	4	3	4	4	4	3
	4	3	4	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	3	3	3	4	1	1	1
	4	3	4	1	1	1	4	4	4	1	1	1
	4	1	4	4	4	1	1	1	1	1	1	1
Session 3	4	4	1	1	4	4	4	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	3	1	1	1	1	1	1	1
	1	1	1	4	4	4	4	4	4	3	3	3
	3	3	3	4	4	3	4	4	4	4	4	4
	3	3	3	2	3	3	4	4	4	3	4	4
	4	1	1	1	4	4	3	4	4	1	4	4
	4	4	4	4	4	4	3	4	4	4	4	4
	4	4	4	4	4	4	4	4	4	4	4	4
	4	4	4	4	4	4	4	4	4	3	4	4

1=cooperation 2=aggression 3=wandering 4=other

DATA ON SUBJECTS

Subject 02 Status Hearing Impaired Female
D.O.B. 04/07/79 AGE: 6yrs 11mths

Session 1

3	4	4	1	3	4	1	1	1	1	1	4
4	1	1	1	1	1	1	1	1	1	1	1
1	4	3	1	1	3	2	1	4	3	2	1
1	3	1	4	3	1	3	4	4	3	1	3
3	1	1	3	1	1	1	3	1	3	1	3
1	1	1	1	1	1	1	1	1	1	1	1
1	1	2	1	1	1	4	4	1	3	1	1
1	1	3	1	1	3	1	1	1	3	4	3
3	3	1	4	1	1	4	4	4	1	1	4
4	1	4	3	3	3	3	3	3	3	3	1

Session 2

3	4	4	3	3	4	4	2	3	4	3	3
1	1	4	1	4	1	3	4	4	3	3	3
3	3	4	4	4	4	3	3	3	4	3	4
3	3	1	4	2	3	3	2	4	4	4	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	4	4	3	1	1	4	4	2	4	4
4	4	4	1	1	1	1	4	1	1	1	3
3	1	1	3	3	3	3	2	4	3	3	3
4	2	4	4	4	4	1	1	4	4	1	4
4	4	4	4	4	4	4	4	4	1	1	1

Session 3

3	3	4	3	4	3	4	3	4	4	4	3
4	4	4	4	3	1	1	1	4	4	3	4
4	4	3	4	4	4	3	4	4	3	4	3
4	4	4	3	3	1	1	1	4	4	1	1
4	1	1	1	1	3	3	3	3	4	4	4
3	3	3	4	4	4	4	4	3	3	3	3
4	3	4	3	1	4	3	4	4	4	4	4
4	4	4	4	1	1	1	1	1	4	4	4
4	1	4	4	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1

1=cooperation 2=aggression 3=wandering 4=other

DATA ON SUBJECTS

Subject 03 Status Non-Hearing Impaired Female
D.O.B 12/15/79 AGE: 6yrs 3mths

Session 1	1	1	1	1	1	1	1	1	4	3	4	3
	3	3	3	3	3	3	4	3	3	4	4	4
	1	3	3	3	3	1	1	3	3	3	3	1
	4	3	4	1	4	1	1	4	1	4	4	3
	1	3	3	1	1	1	1	4	4	4	3	3
	4	4	3	4	3	3	4	3	3	3	3	4
	3	3	3	3	3	3	3	4	4	3	3	3
	3	3	3	3	3	3	3	3	4	1	3	3
	3	3	3	3	3	3	3	3	3	3	3	3
	3	3	3	3	3	3	1	1	1	1	1	1
Session 2	4	3	3	3	3	3	3	3	4	3	3	3
	4	3	4	4	3	4	4	3	3	3	3	3
	3	3	3	3	3	3	3	3	3	3	3	3
	3	3	3	3	3	4	4	3	3	3	3	3
	3	3	3	4	4	4	3	3	3	3	3	4
	1	4	4	3	3	4	4	3	3	3	3	4
	4	3	3	3	3	3	3	3	3	3	3	3
	3	3	3	1	4	4	4	3	3	3	3	3
	3	3	3	3	4	3	3	3	3	3	3	3
	3	3	3	3	3	3	3	3	3	3	3	4
Session 3	4	4	4	4	4	3	4	3	3	3	3	3
	3	3	3	3	3	3	3	3	3	3	3	3
	3	3	3	3	3	3	3	3	3	3	3	3
	3	3	3	3	3	3	3	3	3	3	3	3
	3	3	3	3	3	3	3	3	3	3	3	3
	3	3	3	3	3	3	3	3	3	3	3	3
	3	3	3	4	3	3	3	3	3	3	3	3
	3	3	3	3	3	3	3	3	4	1	1	1
	1	1	4	3	3	3	3	3	3	3	3	3
	3	3	3	4	3	3	3	3	3	3	3	3

1=cooperation 2=aggression 3=wandering 4=other

DATA ON SUBJECTS

Subject 03 Status Hearing Impaired Female
D.O.B 09/11/78 AGE: 7yrs 6mths

Session 1

3	4	4	1	1	4	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	2	2	1	4	1	4	1	1	1
1	3	4	3	1	1	1	4	1	1	1	2
3	3	1	1	1	1	1	1	1	2	4	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	4	2	4	4	3
4	4	4	4	1	3	4	2	4	2	4	3
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	3	1	3	1	1	1	3	1	4

Session 2

4	4	3	2	4	4	4	1	1	1	4	4
4	1	1	1	1	1	1	3	1	3	1	1
1	1	4	2	1	1	1	1	1	4	4	4
4	1	3	4	4	4	1	1	1	1	1	1
1	2	1	1	3	3	1	2	1	1	2	1
1	1	1	2	4	3	1	1	1	2	1	1
4	2	1	1	4	4	1	1	2	4	4	4
4	1	3	4	4	4	1	1	3	1	1	4
3	2	1	4	4	1	3	1	1	1	1	1
3	3	1	4	3	4	4	1	4	3	3	3

Session 3

1	1	1	4	2	4	4	4	4	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	4	1	1	1	1	1
4	1	4	1	1	4	4	4	4	4	1	1
1	1	2	1	1	1	1	1	4	1	1	4
1	1	4	4	1	1	1	1	1	4	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	4	1	1	1	1	1	4	4	1	2

1=cooperation 2=aggression 3=wandering 4=other

DATA ON SUBJECTS

Subject 04 Status Non-Hearing Impaired Female
D.O.B. 09/18/78 AGE: 7yrs 6mths

Session 1

1	1	1	1	1	1	1	1	3	1	1	3
1	1	1	1	4	4	4	1	1	1	4	4
1	4	3	4	3	1	1	3	4	3	4	1
4	3	4	1	4	1	1	4	1	4	4	4
4	1	1	1	1	1	1	1	1	1	1	1
1	1	4	4	3	1	4	4	1	1	3	4
4	4	4	1	1	1	1	3	1	1	3	3
4	4	2	2	2	3	3	3	4	3	4	3
4	3	3	4	4	3	3	3	3	4	3	3
3	3	3	3	3	4	1	1	1	1	1	1

Session 2

1	4	3	3	3	3	4	4	4	4	4	1
1	1	4	4	4	4	4	4	4	4	4	4
4	4	4	4	4	4	4	4	4	4	4	4
4	4	4	4	4	4	4	4	1	1	1	1
1	1	1	1	1	1	1	1	1	1	4	4
1	4	4	3	4	4	4	4	4	2	2	4
1	1	1	1	4	4	4	4	4	4	4	4
2	2	1	1	4	4	4	1	1	1	1	1
2	2	2	2	4	2	2	2	2	4	4	3
4	4	4	4	4	4	4	4	4	4	4	2

Session 3

4	4	4	4	4	4	4	4	4	4	4	4
4	4	1	1	4	4	4	4	4	3	4	4
2	4	4	4	3	3	3	3	4	4	3	4
4	4	4	4	3	4	3	4	4	4	4	4
4	4	4	4	4	4	4	4	4	4	4	4
4	4	4	4	4	4	4	4	4	4	4	4
4	4	4	3	3	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	4	4	4
4	4	4	1	1	1	1	1	2	4	4	4
4	4	4	4	2	4	4	2	4	4	2	4

1=cooperation 2=aggression 3=wandering 4=other

DATA ON SUBJECTS

Subject 04 Status Hearing Impaired Female
D.O.B. 09/06/79 AGE: 6yrs 6mths

Session 1

1	4	1	1	4	4	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
4	4	4	4	3	4	4	4	1	4	1	1
1	1	1	1	4	1	1	3	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	4	1	1	1
3	4	4	4	3	2	1	1	4	1	1	1
1	1	1	1	1	3	4	1	1	1	4	4
3	3	4	1	1	1	4	4	3	4	3	4
1	1	1	3	1	1	3	2	4	4	4	3

Session 2

4	1	1	1	1	1	1	1	4	4	1	4
1	4	1	1	1	1	1	1	1	1	1	1
2	1	1	4	4	4	4	1	1	1	1	1
1	1	4	4	4	4	2	3	4	1	1	1
1	1	3	4	4	3	4	4	2	4	2	4
4	4	4	4	1	1	2	4	4	3	2	4
3	3	3	1	1	1	4	4	3	1	4	4
3	3	3	4	3	3	2	2	3	3	4	4
3	4	3	1	3	3	1	1	1	1	1	1
3	1	1	1	1	1	4	3	4	2	2	2

Session 3

1	1	1	1	1	1	1	2	4	4	4	1
4	3	3	3	4	4	1	4	1	1	1	1
1	1	4	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	3	3	1	1	1	4
1	1	1	1	4	3	1	4	4	4	1	1
1	1	1	4	1	1	3	4	4	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	2

1=cooperation 2=aggression 3=wandering 4=other

DATA ON SUBJECTS

Subject 05 Status Non-Hearing Impaired Female
D.O.B 07/21/79 AGE: 6yrs 8mths

Session 1

1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	4	4	4	4	4	4	4	4	1
1	1	1	1	1	1	1	4	4	4	4	4
4	4	1	1	1	1	1	3	1	1	1	4
4	4	1	1	1	1	1	1	1	1	1	4
4	4	4	1	1	4	4	4	1	1	4	4
4	1	4	4	1	1	1	4	4	1	1	4
4	4	4	4	4	4	4	3	4	1	4	1
4	4	4	4	4	4	4	4	4	4	1	1
1	1	1	1	4	4	4	4	4	4	4	4

Session 2

4	4	4	4	4	4	4	4	4	4	4	4
1	1	1	1	4	4	4	3	4	4	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	3	1	3	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	3	3	4	4
1	1	1	1	1	1	1	1	1	1	1	1
4	2	2	1	4	4	4	4	3	3	3	1
4	4	1	1	1	4	1	1	1	4	3	4
1	4	4	1	1	4	4	1	3	1	1	1

Session 3

1	3	1	1	4	1	1	1	3	3	1	1
1	4	4	4	4	4	1	1	3	3	4	1
4	3	3	3	4	4	1	1	3	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	4	4	1	1	3	3	4	4
4	4	4	4	4	4	4	3	4	1	4	4
4	4	4	4	4	3	1	1	1	3	1	1
1	1	1	1	1	1	1	1	1	1	4	1
1	1	1	1	4	1	1	1	1	1	3	4
4	4	3	4	3	4	4	4	4	4	4	4

1=cooperation 2=aggression 3=wandering 4=other

DATA ON SUBJECTS

Subject 05 Status Hearing Impaired Female
D.O.B 08/12/79 AGE: 6yrs 7mths

Session 1

4	4	4	3	3	3	1	3	4	3	4	1
1	1	1	1	4	1	1	1	1	1	1	1
1	1	1	3	1	3	3	1	4	4	4	4
4	3	3	4	4	4	4	4	4	1	1	3
4	4	3	1	3	4	4	4	2	4	4	4
4	4	4	4	4	3	3	4	3	3	4	4
4	3	1	4	3	3	4	4	4	4	4	4
3	3	1	1	1	1	1	1	1	1	1	1
3	3	1	3	1	1	1	3	1	1	1	1
1	1	1	1	1	2	1	1	1	4	1	1

Session 2

4	4	3	4	4	4	3	3	1	1	3	4
4	3	3	4	4	4	4	4	4	3	3	4
3	3	3	3	4	4	1	1	1	4	4	3
3	3	3	3	3	3	3	4	3	3	3	1
3	3	1	1	4	4	3	3	4	4	1	1
4	4	4	4	4	3	4	4	3	1	1	3
3	4	4	3	3	3	4	4	4	4	4	4
4	3	3	3	4	4	4	4	4	3	4	3
4	3	1	4	4	4	4	4	4	1	1	4
1	1	1	1	1	1	1	1	1	1	3	1

Session 3

3	4	4	1	4	3	4	4	4	4	4	4
4	3	4	4	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	4	4	4	4	4
4	4	4	1	4	4	4	1	1	4	4	3
4	4	3	3	4	3	4	4	1	1	3	1
1	4	4	1	3	4	4	4	3	4	4	1
1	4	4	4	4	4	4	1	4	3	3	3
4	4	4	4	1	1	4	4	4	4	4	4
4	1	1	1	1	1	1	1	1	1	1	1
1	1	3	1	1	1	1	4	1	1	1	1

1=cooperation 2=aggression 3=wandering 4=other

DATA ON SUBJECTS

Subject 06 Status Non-Hearing Impaired Female
D.O.B. 04/18/78 AGE: 7yrs 11mths

Session 1

1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	4	2	4	4	4	4	4	2	4	4	4
1	1	1	1	1	1	1	1	1	1	4	4
4	2	1	1	2	1	4	4	3	3	4	4
4	1	1	1	1	4	1	4	1	1	1	4
1	1	4	4	1	1	1	1	4	1	1	3
4	4	2	4	4	4	4	3	4	4	4	4
4	1	1	4	4	4	4	1	1	1	4	1
3	4	1	1	4	4	4	3	1	1	4	3

Session 2

1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	3	1	1
1	1	1	1	1	1	1	1	1	1	1	4
4	4	4	4	3	4	4	4	1	1	1	1
4	4	4	1	1	4	1	1	1	4	1	1
1	4	3	4	1	4	4	4	4	4	4	4

Session 3

1	4	4	4	4	1	4	2	4	4	1	1
1	1	4	1	1	1	1	1	1	1	4	1
4	1	1	1	1	1	1	1	1	4	4	4
4	4	4	3	4	4	4	4	4	3	3	4
4	4	4	3	4	1	1	1	1	1	1	1
1	1	1	1	1	4	1	1	3	4	4	1
4	4	4	4	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	4	4

1=cooperation 2=aggression 3=wandering 4=other

DATA ON SUBJECTS

Subject 06 Status Hearing Impaired Female
D.O.B. 04/20/79 AGE: 6yrs 11mths

Session 1	1	1	1	1	3	3	1	4	1	1	1	1
	4	4	4	3	3	4	3	1	1	1	1	1
	1	3	1	1	3	4	3	1	4	4	4	4
	4	4	4	4	4	4	4	4	4	1	1	4
	4	4	1	4	4	4	1	4	1	4	4	4
	4	3	4	4	3	3	3	3	4	3	3	4
	4	4	3	4	3	4	1	3	3	4	1	1
	1	1	1	1	1	1	1	1	1	2	1	1
	1	3	4	1	1	1	1	1	1	1	3	1
	1	1	1	1	1	1	3	1	1	1	1	1
Session 2	4	4	4	4	4	4	3	4	3	4	4	4
	4	3	3	4	1	1	4	4	4	4	4	4
	4	4	4	4	4	4	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	2	2	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	3	1
	3	3	4	4	4	4	4	1	1	1	4	4
	4	1	3	4	1	1	1	1	4	4	4	4
	1	4	4	4	4	1	1	1	1	1	1	1
Session 3	4	4	4	4	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	4	1
	4	4	2	3	4	1	1	1	1	1	1	1
	3	4	1	1	4	4	4	4	4	4	1	1
	4	1	1	3	4	1	4	1	1	4	4	4
	4	3	4	1	4	1	1	1	1	1	1	4
	1	2	4	1	1	1	1	1	1	1	2	2
	1	1	1	1	1	1	1	1	1	1	1	1

1=cooperation 2=aggression 3=wandering 4=other

DATA ON SUBJECTS

Subject 07 Status Non-Hearing Impaired Male
D.O.B. 08/29/78 AGE: 7yrs 7mths

Session 1

4	1	1	1	1	1	4	1	1	1	1	1
1	1	1	2	1	1	1	1	1	1	1	1
1	1	1	1	1	1	4	4	4	1	1	4
4	2	1	4	4	1	1	1	1	1	1	1
1	1	4	3	1	1	1	1	1	3	1	1
4	2	4	1	4	1	1	1	1	3	4	4
4	4	4	4	4	4	3	4	4	4	4	4
4	4	1	4	4	4	4	1	1	3	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	3	1

Session 2

1	4	4	4	4	4	4	2	4	1	1	1
1	4	4	4	4	4	1	1	4	2	4	4
4	4	4	2	2	2	1	1	4	4	1	4
4	2	4	4	4	1	4	4	2	4	4	4
4	4	4	1	4	4	4	4	4	1	1	1
1	1	1	2	1	1	1	1	1	1	1	1
1	1	1	4	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	4	1
1	1	1	1	1	1	1	1	1	1	1	1
1	4	2	2	2	4	1	1	1	1	1	1

Session 3

1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	4
1	1	1	1	1	1	1	4	4	1	1	4
4	4	4	4	4	1	4	4	4	4	4	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	4	4	1	1	1	1	1	1	1

1=cooperation 2=aggression 3=wandering 4=other

DATA ON SUBJECTS

Subject 07 Status Hearing Impaired Male
D.O.B. 07/31/78 AGE: 7yrs 8mths

Session 1

3	1	1	4	3	4	1	4	4	4	4	4
4	4	3	4	1	1	2	1	1	1	1	1
1	3	4	4	1	1	4	3	1	1	1	1
1	1	4	4	3	4	2	4	1	3	3	3
3	4	1	2	1	4	4	1	3	4	2	3
4	4	4	4	3	4	4	4	4	3	2	4
4	4	4	3	3	4	3	4	4	4	4	3
3	3	4	4	3	3	4	3	3	4	4	1
1	3	1	3	1	1	1	3	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1

Session 2

4	4	4	4	3	2	2	4	2	4	1	1
1	4	4	4	4	3	3	3	4	1	3	3
4	4	4	1	3	2	4	4	4	4	4	2
3	4	4	3	3	4	4	3	3	1	1	1
1	3	4	4	4	4	3	4	4	3	3	3
2	2	2	4	4	4	4	2	4	4	4	4
4	4	4	4	4	4	3	3	3	3	4	2
2	4	4	3	4	4	4	4	3	4	4	3
3	4	4	4	4	4	4	4	4	4	4	4
4	4	4	4	1	1	1	1	1	1	1	1

Session 3

4	3	4	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	3	1	1	1	1	1	1	4	3
4	4	4	4	1	4	4	4	3	2	4	4
4	1	1	1	4	4	4	4	4	4	4	4
4	4	2	4	4	4	3	4	2	4	4	3
2	3	4	3	4	4	3	4	3	4	4	4
3	3	4	4	3	4	4	2	2	3	3	4
4	3	3	4	4	4	4	1	4	1	1	1

1=cooperation 2=aggression 3=wandering 4=other

DATA ON SUBJECTS

Subject 08 Status Non-Hearing Impaired Male
D.O.B. 06/30/79 AGE: 6yrs 9mths

Session 1	4	1	1	4	1	1	1	4	1	1	1	1
	1	1	1	4	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	4	4	3	4	4	4
	4	4	1	4	4	1	1	1	1	1	1	1
	1	1	4	4	1	1	1	1	1	1	1	1
	4	4	4	1	3	1	1	1	1	4	4	4
	4	4	2	4	4	4	3	4	3	3	4	4
	4	4	1	3	4	4	3	1	1	4	1	1
	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	3	3	1
Session 2	1	3	4	4	3	3	3	3	4	1	1	1
	1	4	4	4	4	1	1	1	4	1	2	4
	4	4	4	3	4	4	1	3	4	3	4	3
	4	1	4	4	4	1	4	4	2	4	4	4
	4	4	4	1	4	4	4	4	4	1	1	1
	1	1	1	3	1	1	1	1	1	1	1	1
	1	1	1	4	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	4	1
	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	4	3	2	4	1	1	1	1	1	1
Session 3	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	4
	1	1	1	1	1	1	1	4	4	1	1	2
	4	4	2	4	4	1	4	2	2	4	4	1
	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	4	4	3	3	3	1	3	3	3

1=cooperation 2=aggression 3=wandering 4=other

DATA ON SUBJECTS

Subject 08 Status Hearing Impaired Male
D.O.B. 04/13/78 AGE: 7yrs 11mths

Session 1	1	4	4	3	3	1	4	1	1	1	1	1
	1	1	4	1	1	1	1	3	4	4	4	1
	4	1	4	4	1	4	4	4	3	3	4	3
	4	4	4	3	4	1	1	3	1	1	1	3
	1	1	1	1	1	1	1	1	4	1	1	1
	1	1	1	1	1	1	1	1	1	1	4	1
	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	4	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1
	1	2	2	1	1	1	1	1	1	1	1	1
Session 2	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	4	4	4
	4	4	4	4	4	4	4	4	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	3	1
	3	3	3	1	1	1	4	3	1	4	3	4
	3	4	4	4	4	4	1	1	4	4	4	1
	1	1	1	4	3	3	4	4	1	4	4	4
	1	4	4	4	4	1	1	1	1	1	1	1
	1	1	4	4	4	3	4	4	4	3	4	3
Session 3	4	4	4	4	1	1	1	1	1	1	1	1
	1	1	1	4	1	4	1	1	1	1	4	1
	4	4	4	4	4	4	4	4	1	4	4	4
	4	4	4	4	1	1	4	4	2	4	4	1
	4	4	4	4	4	4	1	1	1	1	4	3
	4	1	1	4	4	4	4	4	4	4	4	4
	4	4	4	4	4	1	4	1	4	3	4	4
	4	1	1	1	1	4	1	4	1	4	1	4
	4	4	4	4	4	4	4	4	4	3	3	3
	4	4	4	3	4	4	4	4	4	4	4	4

1=cooperation 2=aggression 3=wandering 4=other

DATA ON SUBJECTS

Subject 09 Status Non-Hearing Impaired Male
D.O.B. 08/18/79 AGE: 6yrs 7mths

Session 1	1	4	3	1	1	1	4	4	4	4	4	3
	1	1	1	1	1	1	1	1	4	4	1	1
	1	1	3	3	4	4	4	4	1	4	1	1
	4	4	3	4	4	4	1	1	1	1	1	4
	1	1	1	1	1	1	4	4	1	1	1	1
	4	4	3	1	3	3	4	4	1	1	4	4
	4	1	4	4	4	4	4	1	1	3	4	4
	3	4	4	3	3	3	3	3	3	3	3	3
	3	3	3	3	3	3	3	3	3	3	3	3
	3	3	3	3	3	3	3	3	3	3	3	3

Session 2	4	4	3	4	4	4	4	4	1	1	1	1
	1	3	1	1	3	3	1	3	1	1	1	1
	4	4	4	1	4	4	1	1	4	4	1	4
	3	4	3	3	3	4	4	4	4	3	3	4
	4	4	1	1	1	4	3	4	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	3	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	4	1
	1	1	1	1	1	1	1	1	1	1	1	1
	1	4	4	4	4	3	1	1	1	1	1	1

Session 3	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	4
	1	1	1	1	1	1	3	3	4	3	3	3
	3	3	3	3	3	3	3	3	3	3	3	3
	3	3	3	3	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	4	4	1	1	1	1	1	1	1

1=cooperation 2=aggression 3=wandering 4=other

DATA ON SUBJECTS

Subject 09 Status Hearing Impaired Male
D.O.B. 10/09/78 AGE: 7yrs 5mths

Session 1

1	1	1	1	1	1	1	1	1	1	1	1
1	1	4	4	4	4	4	4	1	1	1	1
1	1	1	4	4	4	4	1	1	1	1	1
1	4	4	4	1	1	1	1	1	1	1	4
1	1	4	1	1	1	1	1	3	1	1	1
1	1	1	1	1	1	1	1	1	1	4	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	2	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	2	1	1	1	1	4

Session 2

1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	4	4	1	1	1	1
1	1	1	4	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	3
1	1	1	1	1	1	1	1	1	1	1	1
1	4	1	1	1	1	1	1	1	1	1	1
1	4	4	4	4	4	4	4	4	4	4	1
1	1	1	1	4	4	4	4	4	1	1	1
1	1	1	1	1	1	1	1	1	3	4	3

Session 3

3	4	4	4	1	1	4	4	1	1	4	4
4	4	1	4	3	1	1	4	4	4	3	1
1	4	4	4	4	4	4	4	1	4	4	4
4	4	4	4	4	1	1	1	1	1	4	4
1	4	4	2	4	1	4	4	4	4	4	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	4
4	4	1	1	4	4	4	4	3	4	4	4

1=cooperation 2=aggression 3=wandering 4=other

DATA ON SUBJECTS

Subject 10 Status Non-Hearing Impaired Male
D.O.B. 09/08/78 AGE: 7yrs 6mths

Session 1	1	1	4	1	1	4	4	4	4	1	4	4
	4	4	4	4	4	4	4	4	4	4	4	4
	2	4	2	4	4	4	4	4	4	2	3	1
	4	4	4	4	4	4	4	4	4	4	1	1
	1	4	4	4	4	4	4	4	4	4	4	4
	4	4	4	4	4	4	4	4	4	4	4	4
	4	4	2	4	1	1	1	1	1	1	1	4
	4	4	1	1	4	4	4	4	4	4	4	1
	1	1	1	1	1	1	1	2	4	1	1	1
	4	4	1	4	4	4	1	1	1	1	4	1
Session 2	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	4	1	2	4
	4	4	4	1	1	1	1	1	4	1	4	4
	4	4	4	4	3	4	4	4	4	4	1	1
	1	1	1	1	1	1	4	4	4	3	1	1
	4	3	4	4	4	4	4	1	4	3	2	2
	4	4	4	4	1	1	1	1	1	3	1	1
	4	2	2	4	2	4	4	4	4	4	4	4
	4	4	2	2	4	4	4	2	2	4	4	4
	4	4	4	4	4	2	4	4	4	4	4	4
Session 3	4	4	4	4	4	4	4	4	4	4	4	4
	2	4	4	4	4	4	4	4	3	3	1	1
	1	3	4	4	4	4	1	1	1	4	4	4
	4	4	4	4	4	4	4	4	4	4	1	4
	4	4	2	4	3	3	4	1	1	1	4	4
	4	4	4	1	1	4	4	4	4	4	4	4
	4	4	4	4	4	4	4	4	4	4	3	4
	4	4	4	4	1	4	4	4	4	4	4	4
	4	4	4	4	4	4	4	4	2	4	4	4
	4	4	4	4	2	4	4	4	4	4	4	2

1=cooperation 2=aggression 3=wandering 4=other

DATA ON SUBJECTS

Subject 10 Status Hearing Impaired Male
D.O.B. 11/29/78 AGE: 7yrs 11mths

Session 1

1	1	1	3	3	3	1	4	1	1	1	1
1	4	1	1	1	1	1	1	1	1	1	1
1	1	1	3	2	2	4	1	1	1	1	1
4	3	3	1	3	1	3	3	1	1	1	1
1	1	1	1	1	1	1	1	3	1	4	4
1	1	1	2	1	1	1	3	4	1	1	4
1	1	1	1	1	1	1	3	3	4	4	4
4	4	3	4	4	4	2	2	2	4	4	2
3	1	1	1	1	1	1	1	1	1	1	4
3	1	4	1	1	4	4	1	1	1	4	4

Session 2

4	2	4	4	4	1	4	4	4	4	4	4
3	4	4	4	4	4	4	1	1	1	1	4
1	1	4	4	4	2	4	3	2	3	4	4
4	4	4	4	4	4	4	3	1	4	1	1
1	1	4	4	4	4	3	4	4	4	3	3
4	4	4	4	4	4	4	1	4	1	1	1
1	4	4	4	1	4	4	4	4	4	4	4
3	4	4	4	1	1	4	4	1	1	1	1
3	4	3	4	3	3	1	1	1	1	1	1
1	1	1	1	1	1	4	4	3	3	3	4

Session 3

4	4	1	1	1	1	3	4	4	4	4	4
4	4	3	3	4	4	4	4	4	3	4	4
4	4	4	1	1	1	1	1	1	4	4	4
4	1	1	1	1	1	1	1	1	1	1	1
1	4	4	4	4	4	4	4	4	1	1	1
1	3	4	4	4	4	4	4	4	4	4	4
4	4	4	4	4	4	4	4	4	4	4	4
2	3	3	3	4	1	1	1	1	4	4	4
4	4	4	4	1	1	1	1	4	4	4	1
4	4	1	4	4	1	1	1	1	1	1	1

1=cooperation 2=aggression 3=wandering 4=other

DATA ON SUBJECTS

Subject 11 Status Non-Hearing Impaired Male
D.O.B. 01/05/80 AGE: 6yrs 2mths

Session 1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	3	3	3	1	3	3	1
	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	4	4	4	4	4	4	4	4
	4	4	4	4	4	4	1	4	1	1	1	4
	1	1	4	4	4	4	4	4	4	4	4	4
	4	4	4	4	4	4	4	4	4	4	1	1
	4	1	4	4	4	4	4	1	1	1	4	1
	4	4	1	1	4	4	4	4	1	1	4	4
Session 2	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	3	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1
	1	3	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1
	3	1	3	3	1	1	1	1	1	1	1	1
	4	4	4	1	1	1	3	4	1	4	4	4
	4	4	1	1	1	4	4	1	1	4	1	3
	1	1	1	3	3	4	4	4	1	1	1	4
Session 3	4	4	4	4	4	4	4	4	4	4	4	4
	4	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1
	4	4	4	4	4	4	4	4	4	4	4	4
	4	4	4	3	4	4	1	1	1	1	1	1
	1	1	1	1	1	1	4	4	4	4	4	3
	4	4	4	4	1	1	1	1	1	1	1	1
	1	1	4	1	4	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1

1=cooperation 2=aggression 3=wandering 4=other

DATA ON SUBJECTS

Subject 11 Status Hearing Impaired Male
D.O.B. 06/03/78 AGE: 7yrs 9mths

Session 1	1	1	1	4	4	4	4	4	1	1	1	1
	1	4	4	1	1	1	1	1	1	1	1	1
	1	1	1	1	4	3	1	4	4	2	4	4
	1	4	3	4	3	4	4	4	1	1	1	4
	4	4	1	4	4	1	1	1	4	4	4	4
	1	1	4	4	4	4	4	4	4	1	1	4
	1	4	2	3	4	4	4	4	4	3	4	4
	4	3	4	1	1	2	1	1	4	1	2	4
	4	4	4	4	4	1	4	4	1	1	4	4
	1	1	1	1	1	1	1	1	1	1	3	1
Session 2	4	4	4	4	4	1	4	4	2	1	3	1
	1	1	1	1	1	1	1	1	1	1	1	1
	2	1	1	4	4	1	1	1	1	1	1	1
	1	1	2	2	4	1	1	1	1	1	1	1
	1	4	1	1	4	1	4	1	2	1	1	1
	1	1	1	1	2	2	2	1	2	2	2	4
	4	3	2	2	2	4	1	1	4	4	4	2
	1	4	4	2	2	2	4	1	4	4	1	4
	2	4	4	4	4	1	1	1	1	1	4	1
	1	1	1	2	4	4	2	2	4	4	4	2
Session 3	4	4	1	1	1	1	4	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	2	4	4	4	1	1	3
	3	4	3	4	2	4	4	4	4	2	2	1
	1	4	1	1	1	1	4	4	4	1	1	1
	4	1	1	1	1	1	1	1	1	4	4	4
	4	4	4	1	4	1	1	1	1	3	1	4
	4	4	2	2	4	1	1	1	1	1	1	1

1=cooperation 2=aggression 3=wandering 4=other

DATA ON SUBJECTS

Subject 12 Status Non-Hearing Impaired Male
D.O.B. 10/02/78 AGE: 7yrs 5mths

Session 1

4	4	4	4	4	3	3	4	3	4	4	4
4	4	3	4	4	1	4	1	1	4	4	4
4	2	4	4	4	4	4	2	4	4	2	2
2	4	4	4	4	4	4	4	4	2	2	4
2	4	2	2	2	4	4	1	1	1	1	1
1	4	4	4	4	4	4	3	2	4	4	4
4	4	2	4	4	4	4	2	2	4	4	4
2	2	4	2	2	2	4	4	4	3	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1

Session 2

4	4	4	4	3	4	4	1	4	3	4	1
4	4	4	4	4	4	4	4	4	4	4	4
1	1	1	4	4	4	4	4	4	4	4	4
4	1	4	4	4	4	4	4	4	4	4	4
4	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	4
1	4	4	1	1	1	1	1	1	1	3	4
1	4	4	4	4	4	4	1	1	1	1	1
4	4	4	4	2	2	2	2	2	2	4	4
4	4	4	4	4	3	4	4	4	4	4	4

Session 3

4	3	3	3	3	4	4	4	4	4	4	4
4	4	1	1	4	4	4	4	4	3	4	4
2	4	3	4	4	4	4	4	4	4	3	4
1	3	3	4	4	4	4	4	4	4	2	3
2	4	3	4	4	4	4	4	4	4	3	3
3	2	2	1	1	4	1	4	4	4	4	4
4	4	4	3	4	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	3	3	3	3	3	2	4	3
3	3	1	1	2	2	2	4	4	4	2	2

1=cooperation 2=aggression 3=wandering 4=other

DATA ON SUBJECTS

Subject 12 Status Hearing Impaired Male
D.O.B. 01/19/80 AGE: 6yrs 2mths

Session 1	4	4	3	4	3	4	1	1	1	4	4	1
	1	1	1	1	4	1	1	1	1	1	1	4
	4	1	1	1	1	1	1	4	1	1	1	1
	1	1	3	1	4	4	1	1	4	4	4	1
	4	4	4	4	4	1	1	1	4	4	4	4
	1	1	1	4	4	4	4	4	4	4	4	4
	3	3	4	4	3	4	3	4	1	4	4	4
	4	4	4	1	4	4	1	1	1	1	1	1
	4	3	4	3	3	4	4	1	4	4	4	4
	4	4	4	4	4	3	3	4	3	4	1	2
Session 2	4	4	4	1	4	4	4	4	4	4	4	4
	3	4	4	4	4	1	1	4	4	4	4	4
	4	4	4	4	4	4	4	4	4	4	4	4
	4	4	4	4	4	4	4	4	4	4	4	1
	1	1	1	1	1	1	1	4	4	1	1	1
	1	2	3	3	4	4	4	1	4	4	1	4
	4	1	4	4	4	4	1	1	1	1	3	4
	4	3	4	4	4	4	4	4	4	4	4	3
	3	4	4	4	1	1	1	4	1	1	1	1
	1	1	1	1	1	1	3	4	4	4	4	1
Session 3	4	4	4	4	4	4	3	4	4	3	4	1
	4	4	4	3	1	1	1	1	1	1	1	1
	1	1	1	1	1	4	4	1	4	4	4	4
	4	4	4	1	1	4	4	1	1	1	4	4
	4	1	4	4	2	4	4	4	1	1	4	4
	4	4	1	4	4	4	4	4	4	3	4	1
	1	4	4	4	4	4	1	3	4	4	4	4
	4	4	4	4	4	3	4	1	4	1	4	4
	4	4	4	4	4	4	4	4	2	4	4	4
	4	3	3	3	4	4	4	4	4	4	4	1

1=cooperation 2=aggression 3=wandering 4=other

Aggregated Cooperation Scores for Subjects In All Sessions

Subject	Hearing				Hearing Impaired			
	Session				Session			
	1	2	3	Total	1	2	3	Total
01	70	111	72	253	82	50	58	190
02	72	89	37	198	67	37	39	143
03	28	2	5	35	83	59	96	238
04	53	30	23	106	78	51	95	224
05	58	75	61	194	50	26	50	126
06	64	96	79	239	57	69	86	212
07	79	67	104	250	45	17	50	112
08	76	69	100	245	88	69	36	193
09	40	76	95	211	100	97	67	264
10	35	45	13	93	73	36	43	152
11	64	95	77	236	54	60	82	196
12	35	42	31	108	46	36	30	112

Aggregated Aggression Scores for Subjects In All Sessions

Subject	Hearing				Hearing Impaired			
	Session				Session			
	1	2	3	Total	1	2	3	Total
01	0	0	0	0	16	22	9	47
02	0	0	1	1	3	6	0	9
03	0	0	0	0	7	10	3	20
04	3	13	5	21	2	11	2	15
05	0	2	0	2	2	0	0	2
06	5	0	1	6	1	2	4	7
07	3	11	0	14	5	11	6	22
08	1	3	2	6	2	0	1	3
09	0	0	0	0	2	0	1	3
10	5	11	5	21	7	3	1	11
11	0	0	0	0	4	23	6	33
12	20	6	11	37	1	1	2	4

Aggregated Wandering Scores for Subjects In All Sessions

Subject	Hearing				Hearing Impaired			
	Session				Session			
	1	2	3	Total	1	2	3	Total
01	8	2	8	18	10	15	5	30
02	12	13	17	42	30	30	28	88
03	69	94	105	268	11	17	0	28
04	30	6	10	46	12	21	7	40
05	2	10	17	29	26	41	14	81
06	7	3	5	15	22	8	4	34
07	6	0	0	6	27	25	17	69
08	9	11	6	26	9	12	6	27
09	43	14	21	78	1	3	4	8
10	1	5	6	12	16	15	8	39
11	5	9	2	16	7	2	4	13
12	6	4	23	33	13	8	9	30

Aggregated Other Behaviour Scores for Subjects In All Sessions

Subject	Hearing				Hearing Impaired			
	Session				Session			
	1	2	3	Total	1	2	3	Total
01	42	7	40	89	12	33	48	93
02	36	18	65	119	20	47	53	120
03	23	24	10	57	19	34	21	74
04	34	71	82	187	28	37	16	81
05	60	33	42	135	42	53	56	151
06	44	21	35	100	40	41	26	107
07	32	42	16	90	43	67	47	157
08	34	37	12	83	21	39	77	137
09	37	30	4	71	17	20	48	85
10	79	59	96	234	24	66	68	158
11	51	16	41	108	55	35	28	118
12	59	68	55	182	60	75	79	214

Aggregated Behavioural Change Scores for Subjects In All Sessions

Subject	Hearing				Hearing Impaired			
	Session				Session			
	1	2	3	Total	1	2	3	Total
01	23	13	31	67	41	60	62	163
02	25	28	26	79	59	51	46	156
03	40	26	11	77	43	61	27	131
04	43	26	26	95	42	54	26	122
05	27	31	39	97	46	47	41	134
06	44	16	28	88	47	25	33	105
07	34	33	10	77	57	43	43	143
08	35	40	17	92	34	30	40	104
09	35	34	7	76	19	14	29	62
10	23	24	13	60	45	42	26	113
11	37	27	38	102	49	48	30	127
12	31	36	27	94	48	31	41	120

Appendix E

1) Free Play Observation Matrix.

FREE PLAY OBSERVATION MATRIX

SESSION 1 2 3 SUBJECT _____ OBSERVER _____
H / H.I.

		1 2 3 4 5 6 7 8 9	1 2 3 4 5 6 7 8 9	1 2 3 4 5 6 7 8 9	1 2 3 4 5 6 7 8 9	1 2 3 4 5 6 7 8 9	1 2 3 4 5 6 7 8 9
COOPERATION	assisting						
	taking turns						
	physical contact						
	sharing						
	leading/ following						
	task coordination						
AGGRESSION	physical contact						
	threat of physical contact						
	restraining						
	destroying/ terminating activity						
WANDERING	solo unoccupied						
	solo onlooker						
	other						